

INTERMOUNTAIN POWER SERVICE CORPORATION

CONTRACT 05-45652

and

SPECIFICATIONS 45652

for

ELECTRICAL CONSTRUCTION WORK

CONTRACT ISSUED TO:

**CACHE VALLEY ELECTRIC
2345 SOUTH JOHN HENRY DRIVE
SALT LAKE CITY, UT 84119**

CONTRACT ADMINISTRATOR: JON CHRISTENSEN

BUYER: JOHN LARSEN

CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT, entered into this 18th day of February 2005, between the **INTERMOUNTAIN POWER SERVICE CORPORATION (IPSC)**, a nonprofit organization under contract to the Intermountain Power Agency (IPA), a political subdivision of the state of Utah, organized and existing under the Interlocal Co-Operation Act, Title 11, Chapter 13, Utah Code Annotated 1953, as amended, and **Cache Valley Electric Company**, a Corporation, with its principal office in Salt Lake City, UT, hereinafter called the (Contractor),

WHEREAS, IPSC has prepared specifications and other Contract Documents for **Electrical Construction Work** as detailed in the Contract Documents (the Work), and has requested proposals from bidders to perform the Work;

WHEREAS, Contractor has submitted to IPSC a Proposal in accordance with the terms of this Contract Agreement; and

WHEREAS, IPSC has determined and declared Contractor to be the lowest and best, regular responsible bidder for the said Work, subject to execution of this Contract Agreement;

AGREEMENTS: In consideration of the compensation to be paid to Contractor, and of the mutual terms and conditions contained herein, IPSC for itself and its successors, and Contractor for itself and its permitted successors and assigns, hereby agree as follows:

ARTICLE I: Contractor shall perform in accordance with the provisions of this Contract Agreement, including the Contract Documents identified in Article III hereof.

ARTICLE II: Contractor will be paid for its performance under this Contract Agreement in accordance with the provisions of the Contract Documents, including those provisions in the Article entitled "Sole Responsible Party" in Part E, Division E1, General Conditions.

ARTICLE III: The term Contract Documents means and includes all of the following:

<u>PART</u>	<u>DIVISION</u>	<u>TITLE</u>
A	A1	Notice Inviting Proposals
B	B1	Instructions to Bidders
C		<u>Bidding Documents</u>
	C1	Bidders Bond
	C1	Proposal
	C1	Labor, Material, and Performance Bond
	C2	Proposal Schedule for Electrical Construction Work
	C3	Wage Breakdown Form for Time and Material Work
	C4	Fixed Percentage Markups for Time and Material Work
	C5	Equipment Rental Rates for Time and Material Work
D	D1	Contract Documents Description
E	E1	General Conditions
	E2	Additional General Conditions
F		<u>Detailed Specifications</u>
	F1	Special Conditions
	F2	Detailed Requirements for Fixed Price Work
	F3	Detailed Requirements for Time and Material or Other Work

Attachments

1. IPSC Safety Documents
2. IPP 9255 Construction Modification Services 71.0603
3. PAI #101 - Spill Prevention Control and Countermeasure Plan
PAI #106 - Hazardous Materials and Waste
PAI #144 - Minimization and Control of Hazardous Material and Waste
4. Job Package #1: IGS02-07 ID Fan Drive Installation
5. Job Package #2: IGS03-09 Flame Scanner Installation
6. Job Package #3: IGS04-08 O₂ Probes
7. Job Package #4: IGS04-09 Chimney Hoist Power
8. Job Package #5: IGS04-23 Fiber Optic Cable for Telephone Switch

The foregoing Contract Documents, and the documents identified in Part D "Contract Documents Description," are an integral part of this Contract Agreement and are hereby incorporated as part of this Contract Agreement as if fully restated herein. The above listed Contract Documents shall prevail over other information submitted with Contractor's Proposal.

ARTICLE IV: This Contract Agreement, including the Contract Documents, constitutes the entire Agreement of the parties hereto with respect to the Work and other subjects addressed herein, and supersedes all prior oral communications or written documents.

WHEREFORE, IPSC and Contractor execute this Contract Agreement as of the date stated in the first introductory paragraph.

INTERMOUNTAIN POWER SERVICE CORPORATION

850 West Brush Wellman Road
Delta, UT 84624-9546

By: George W. Cross
George W. Cross
President and Chief Operations Officer

2/18/05
Date

CACHE VALLEY ELECTRIC COMPANY

2345 SOUTH JOHN HENRY DR.
SALT LAKE CITY, UT 84119

By: Mike Dameworth
Title: V.P.

FEBRUARY 17, 2005
Date

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Attachments

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PART A - DIVISION A1

NOTICE INVITING PROPOSALS

The Intermountain Power Service Corporation (IPSC) invites sealed bids for furnishing and delivering **Electrical Construction Work** in accordance with **Specifications 45652** available in the Purchasing Section, Intermountain Power Service Corporation, 850 West Brush Wellman Road, Delta, UT 84624-9546.

Proposals shall be submitted on IPSC's bidding forms. All Proposals shall be filed with the Buyer at the above address on or before **4:00 p.m., Wednesday, January 26, 2005**.

Each Proposal shall be accompanied by a certified or cashier's check payable to Intermountain Power Agency (IPA), or a surety bond payable to IPA, IPSC, and the Los Angeles Department of Water and Power (LADWP) in the amount of One Thousand Dollars (\$1,000) as a guarantee that the bidder shall execute the proposed Contract Agreement if awarded.

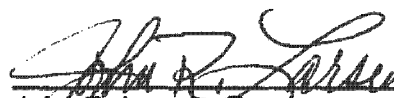
Proposals shall be subject to acceptance within, and irrevocable for, a period of ninety (90) calendar days after date of bid opening.

IPSC reserves the right to reject any and all Proposals.

The successful bidder shall furnish a Performance Bond in the amount of Fifty Thousand Dollars (\$50,000), and shall keep the Performance Bond in place at all times thereafter until all obligations under the Contract have been discharged.

In the performance of any Contract awarded, the bidder shall not discriminate in employment practices against any employee or applicant for employment because of race, religion, national origin, ancestry, sex, age, or physical disability.

Dated: January 14, 2005


John R. Larsen, Buyer
Intermountain Power Service Corporation

PART B - DIVISION B1

INSTRUCTIONS TO BIDDERS

1. **Form, Signature, and Delivery of the Proposals:** The bidder's Proposal shall be made on the yellow copy of the Bidding Documents. The Specifications printed on white paper shall be retained by the bidder.

The bidder's name, address, and the date shall be stated in the Proposal. The Proposal shall be signed by the person authorized to bind the bidder.

The Proposal shall be enclosed in a sealed envelope, plainly marked in the upper left-hand corner with the name and address of the bidder. The envelope shall bear the words "Proposal for," followed by the Specifications Number, the title of the Specifications, and the date of bid opening.

If the Proposal is mailed, it shall be addressed as follows:

Purchasing Section
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, UT 84624-9546

If the Proposal is sent by messenger, it shall be delivered to the Administration Building, Intermountain Power Service Corporation, 850 West Brush Wellman Road, Delta, Utah.

2. **Interpretations and Addenda:** Should a bidder find discrepancies or omissions in the plans, specifications, or other documents, or should there be doubt as to their true meaning, the bidder shall submit to the Buyer a written request for an interpretation or clarification thereof. A request for addenda, interpretation, or clarification shall be delivered to the Buyer marked "Request for Interpretation" and must be received by the Buyer in time to permit a reasonable response before the date of opening bids. Any interpretation of, or change in the documents will be made only by addendum issued to each person to whom Specifications have been issued and will become a part of any Contract awarded. IPSC will not be responsible for or bound by any other explanations or interpretations.
3. **Correspondence:** All inquiries or correspondence to IPSC prior to award of the Contract shall be addressed to the Buyer.
4. **Changes or Alternatives:** The bidder shall not change any wording in the documents. Any explanations or alternatives offered shall be submitted in a letter attached to the front of the Bidding Documents. Alternatives which do not substantially comply with IPSC's specifications cannot be considered. Language of negation or limitation of any rights, remedies, or warranties provided by law will not be considered part of the Proposal. Bids offered subject to conditions or limitations may be rejected.

DIVISION B1

INSTRUCTIONS TO BIDDERS

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5. Specified Materials or Equivalent: Whenever any particular material or process is specified by a patent or proprietary name, by a trade or brand name, of a manufacturer, such wording is used for the purpose of describing the material or process, fixing the standard of quality required, and shall be deemed to be followed by the words "or equivalent." The bidder may offer any material or process which shall be the equivalent of that so specified, but the bidder must identify the equivalent offered.
 6. Language: Everything submitted by the bidder shall be written in the English language.
 7. Sales or Use Taxes: Prices quoted by the bidder shall not include any applicable sales or use taxes or Federal Excise Taxes.
 8. Duties: Prices quoted by the bidder shall include all applicable duties.
 9. Award of Contract: Award of Contract will be made to the lowest and best, regular responsible bidder. The determination as to which is the lowest and best, regular responsible bidder will be made at IPSC's sole discretion, based on IPSC's assessment of all factors that it deems relevant. Such factors include but are not limited to the lowest ultimate cost of the services, materials, equipment, or other Work to be provided under the Contract; other work already in place and use at IPSC; bidder's experience in the industry and/or experience with IPSC; bidder's financial strength; warranties and service offered in bidder's proposal; and any exceptions by bidder to these Specifications, including purported limitations on warranties or remedies. The right is reserved to reject any or all Proposals.

Within ten (10) calendar days after the date of Award of Contract, the successful bidder shall sign the Contract supplied by IPSC. The Contract will be effective upon execution by IPSC. Award of Contract is subject to execution of IPSC's form of Contract Agreement and other Contract Documents.

10. Bidder's Bond: The Proposal shall be accompanied by a certified check or a cashier's check issued by a responsible bank, payable in the state of Utah to the order of Intermountain Power Agency, in an amount not less than One Thousand Dollars (\$1,000). A surety bond payable to IPA, IPSC, and LADWP in a like amount will be accepted in lieu of a check.

The surety bond shall be submitted on IPSC's Bidder's Bond form. The check or bidder's bond shall be enclosed in the same envelope with the Proposal.

11. Performance Bond: Within thirty (30) calendar days after date of award of Contract, the successful bidder shall furnish a Performance Bond, payable to IPA, IPSC, and LADWP, equal to Fifty-Thousand Dollars (\$50,000).

DIVISION B1

INSTRUCTIONS TO BIDDERS

12. Pre-Bid Meeting: A pre-bid meeting will be held at the Intermountain Generating Station in Delta, UT on Friday, January 7, 2005. All bidders must attend this meeting to be eligible to bid on this Project.
13. Contractor's Organization: Each bidder shall submit, with the Proposal, an organization chart showing the names, titles, and general location of office and field management and supervisory personnel who would be directly responsible for proper execution of the Work.
- Prior to award, those personnel shown in the organization chart who will be directly responsible for interface with IPSC in providing the specified construction services shall meet with the IPSC President and Chief Operations Officer and his appointed representatives to ensure complete understanding and compatibility.
14. Utah License: Only Proposals from Contractors licensed under the laws of the state of Utah will be considered.

PART C - DIVISION C1**BIDDING DOCUMENTS****BIDDER'S BOND**

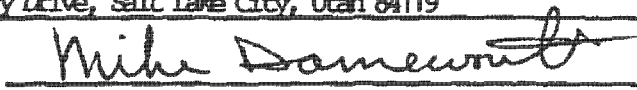
(Not necessary when certified or cashier's check accompanies bid. See below*.)

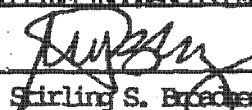
SURETY BOND

We, the undersigned principal and surety, acknowledge ourselves jointly and severally bound to Intermountain Power Agency (IPA) and Intermountain Power Service Corporation (IPSC) of the state of Utah, and the City of Los Angeles Department of Water and Power (LADWP), in the sum of One Thousand Dollars (\$1,000), to be paid to IPA if the attached Proposal shall be accepted and the proposed Contract awarded to said bidder, and said bidder shall fail to execute the Contract and bond for the faithful performance thereof; otherwise this obligation to be void.

Dated: January 26, 2005

Firm Name: CACHE VALLEY ELECTRIC COMPANY, A Utah Corporation, 2345 South John
Henry Drive, Salt Lake City, Utah 84119

By: 
(Signature)**

(Surety): NATIONAL FIRE INSURANCE COMPANY OF HARTFORD, A Connecticut Corporation
By: 
(Signature) Stirling S. Broadhead, Attorney-In-Fact

*When bidder is submitting a check in lieu of a bond, the check must be made payable to Intermountain Power Agency, must either be certified by a responsible bank, or be a cashier's check issued by a responsible bank, and must be payable in the state of Utah.

If check is submitted herewith, state check number _____ and amount \$ _____.

**See Form, Signature, and Delivery of the Proposals, Division B1.

NOTE: All signatures above must be written in ink.

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That Continental Casualty Company, an Illinois corporation, National Fire Insurance Company of Hartford, a Connecticut corporation, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania corporation (herein called "the CNA Companies"), are duly organized and existing corporations having their principal offices in the City of Chicago, and State of Illinois, and that they do by virtue of the signatures and seals herein affixed hereby make, constitute and appoint

Sam W Clark, John R Barton, Stirling S Broadhead, Individually

of Salt Lake City, UT, their true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on their behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind them thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of their corporations and all the acts of said Attorney, pursuant to the authority hereby given is hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law and Resolutions, printed on the reverse hereof, duly adopted, as indicated, by the Boards of Directors of the corporations.

In Witness Whereof, the CNA Companies have caused these presents to be signed by their Vice President and their corporate seals to be hereto affixed on this 16th day of September, 2003.



Continental Casualty Company
National Fire Insurance Company of Hartford
American Casualty Company of Reading, Pennsylvania

Michael Gengler Senior Vice President

State of Illinois, County of Cook, ss:

On this 16th day of September, 2003, before me personally came Michael Gengler to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Chicago, State of Illinois; that he is a Senior Vice President of Continental Casualty Company, an Illinois corporation, National Fire Insurance Company of Hartford, a Connecticut corporation, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania corporation described in and which executed the above instrument; that he knows the seals of said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed pursuant to authority given by the Boards of Directors of said corporations and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporations.



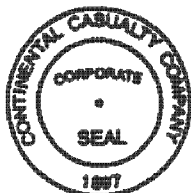
My Commission Expires September 17, 2006

Eliza Price Notary Public

CERTIFICATE

I, Mary A. Ribikawskis, Assistant Secretary of Continental Casualty Company, an Illinois corporation, National Fire Insurance Company of Hartford, a Connecticut corporation, and American Casualty Company of Reading, Pennsylvania, a Pennsylvania corporation do hereby certify that the Power of Attorney herein above set forth is still in force, and further certify that the By-Law and Resolution of the Board of Directors of the corporations printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporations this

26th day of JANUARY, 2005



Continental Casualty Company
National Fire Insurance Company of Hartford
American Casualty Company of Reading, Pennsylvania

Mary A. Ribikawskis Assistant Secretary

NOTICE

In accordance with the Terrorism Risk Insurance Act of 2002, we are providing this disclosure notice for bonds and certain insurance policies on which one or more of the Writing Companies identified below is the surety or insurer.

To principals on bonds and insureds on certain insurance policies written by any one or more of the following companies (collectively the "Writing Companies") as surety or insurer: Western Surety Company, Universal Surety of America, Surety Bonding Company of America, Continental Casualty Company, National Fire Insurance Company of Hartford, American Casualty Company of Reading, PA, The Firemen's Insurance Company of Newark, NJ, and The Continental Insurance Company.

DISCLOSURE OF PREMIUM

The premium attributable to coverage for terrorist acts certified under the Act was Zero Dollars (\$0.00).

DISCLOSURE OF FEDERAL PARTICIPATION IN PAYMENT OF TERRORISM LOSSES

The United States will pay ninety percent (90%) of covered terrorism losses exceeding the applicable surety/insurer deductible.

PART C - DIVISION C1PROPOSAL

The undersigned hereby proposes to furnish and deliver **Electrical Construction Work** to the Intermountain Power Service Corporation in accordance with **Specifications 45652**.

The undersigned agrees, upon the acceptance of this Proposal, (a) to execute IPSC's form of Contract (including the Contract Agreement and other Contract Documents identified in said Specifications) for furnishing and delivering the items and services embraced in the accepted Proposal, (b) to perform its obligations under the Contract at the prices stated in the accompanying Proposal Schedule, and (c) to furnish a Performance Bond conditioned upon the faithful performance of the Contract.

The undersigned furthermore agrees that, in case of failure to execute such Contract Agreement and provide the necessary Performance Bond, the check or Bidder's Bond accompanying this Proposal, and the monies payable thereon, shall be forfeited to and remain the property of IPA.

The undersigned declares under penalty of perjury that this Proposal is genuine, is not a sham or collusive, and is not made in the interest or in behalf of any person or entity not herein named. The undersigned further declares under penalty of perjury that the bidder has not directly or indirectly induced or solicited any other bidder to submit a sham bid, or any other person, firm, or corporation to refrain from bidding. The undersigned also declares under penalty of perjury that the bidder has not in any manner sought by collusion to secure for itself an advantage over any other bidder.

I declare under penalty of perjury under the laws of the state of Utah that the foregoing is true and correct.

Date: 1/25/05, 20

Bidder: Cache Valley Elec.

Address: 2345 So. John Henry Dr.
Salt Lake City UT 84119

Signed By: Mike Dameworth
(Authorized Signature)

Print Name: Mike Dameworth

Title: V.P.

Contract No. _____

Bond No. _____

PART C - DIVISION C1

LABOR, MATERIAL, AND PERFORMANCE BOND

1. Know all persons by these presents, that

(Insert Contractor's name and address or legal title.)

as Principal, hereinafter called Contractor, and

as Surety, hereinafter called Surety, are held and firmly bound unto Intermountain Power Agency, Intermountain Power Service Corporation, hereinafter called IPSC, and the City of Los Angeles Department of Water and Power, as Obligees, in the amount of Fifty Thousand Dollars (\$50,000) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

2. WHEREAS, Contractor has by written agreement dated _____, 20____, entered into a Contract Agreement with IPSC for Electrical Construction Work in accordance with Contract No. 05-45652 which Contract is attached hereto and by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE,

3. THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, and shall promptly make payment to all claimants for labor and material used or supplied for use in the performance of the Contract, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.
4. Whenever Contractor shall be, and declared by IPSC to be, in default under the Contract, IPSC having performed IPSC's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:
- a. Complete the Contract in accordance with its terms and conditions, or
 - b. Obtain a bid or bids for submission to IPSC for completing the Contract in accordance with its terms and conditions, and upon determination by IPSC and Surety of the lowest and best, regular responsible bidder acceptable to IPSC, arrange for a Contract between such bidder and IPSC, and make available as Work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of Completion arranged under this

Contract No. _____
Bond No. _____

paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract price, but not exceeding the amount of the Bond. The term "Balance of the Contract price," as used in this paragraph, shall mean the total amount payable to Contractor under the Contract and any amendments thereto, less the amount previously paid to Contractor.

5. Upon failure of Contractor to timely pay laborers and material men, Surety agrees to discharge such obligation in an amount not exceeding the sum set forth above and also, in case suit is brought upon this bond, a reasonable attorney's fee to be fixed by the court. This bond shall inure to the benefit of any and all persons named in Title 14, Chapter 2, Utah Code, as amended, so as to give a right of action to such persons or their assigns in any suit brought upon this bond.
6. No right of action shall accrue on this bond to or for the use of any person or corporation other than named herein, or the heirs, executors, administrators, or successors and assigns of the Obligees, except as provided by statutory or regulatory provisions relating to Contractor's bonds upon public and private contracts, the provisions of which are made a part hereof as a supplemental description of the Surety's obligations herein.
7. Surety hereby waives notice of any change orders or extensions of time made by IPSC in accordance with the terms of the Contract.
8. SIGNED AND SEALED this _____ day of _____ A.D. 20_____

In the presence of: _____
(Principal)

(Seal)

(Witness)

(Title)

(Seal)

(Surety)

(Witness)

(Title)

PART C - DIVISION C2**PROPOSAL SCHEDULE FOR ELECTRICAL CONSTRUCTION WORK**

Proposal is hereby made to furnish **Electrical Construction Work**, inclusive of all tools, labor, equipment, material, overhead, and administration as needed for electrical construction work as specified in the Contract Documents, F.O.B. Intermountain Generating Station (IGS) plant site, 850 West Brush Wellman Road, Delta, Utah, full freight allowed:

Firm Price Bid:

Job #1: IGS02-07 ID Fan Drive Installation:

\$ 102,138.⁰⁰

Job #2: IGS03-09 Flame Scanner Installation:

\$ 71,465.⁰⁰Job #3: IGS04-08 O₂ Probes:\$ 99,935.⁰⁰

Job #4: IGS04-09 Chimney Hoist Power:

\$ 24,995.⁰⁰

Job #5: IGS04-23 Fiber Optic Cable for Telephone Switch:

\$ 10,276.⁰⁰

All Work shall be completed according to the Contract Documents.

Cash Terms: A discount for prompt payment is offered of 0 percent for Contract payments made within calendar days after date of acceptance or delivery and receipt of invoice.

Taxes: The foregoing quoted prices are exclusive of all applicable sales and use taxes.

Form of Business Organization: The bidder shall state below the form of its business organization.

Bidder is a: Corporation, organized under the laws of the state of Utah.
(Corporation, Partnership, Limited Partnership, Individual)

If a partnership, the bidder shall state below the names of the partners. If a corporation, the bidder shall state below the names of the president and of the secretary.

Jim Raub, president _____
Boyd Lewis, secretary _____

Person to Contact: Should IPSC desire information concerning this Proposal, please contact:

Name: Mike Damewarth Telephone No: 801-908-2644

Address: 2345 So. John Henry Dr., Salt Lake City, UT 84119

(If different, the address of bidder's chief executive office is:) 919 North 1000 West, Provo UT 84321

PART C - DIVISION C3WAGE BREAKDOWN FORM FOR TIME AND MATERIAL WORKHourly Payroll Cost Calculations

The bidder shall complete one (1) copy of this Wage Breakdown Form for each craft and each level of personnel anticipated to be utilized in performing the Work including Foreman, Journeyman, Apprentice, etc., as shown within the bidder's proposed organizational chart.

Craft: Electrical Local Union (if applicable): 354

Title: Gen. Foreman Location: DELTA, Utah

These rates effective from 1/1/05 to 5/31/05

	<u>Straight Time</u>	<u>Time & a Half</u>	<u>Double Time</u>
1. Base Rate	<u>28.62</u>	<u>42.93</u>	<u>57.24</u>
2. Vacation (if applicable)	<u>0</u>	<u>0</u>	<u>0</u>
3. Subtotal - Fee Base	<u>28.62</u>	<u>42.93</u>	<u>57.24</u>
4. Subsistence	<u>3.00</u>	<u>3.00</u>	<u>3.00</u>
5. Travel Pay	<u>0</u>	<u>0</u>	<u>0</u>
6. Subtotal	<u>31.62</u>	<u>45.93</u>	<u>60.24</u>
7. Union Contributions (if applicable):			
Health and Welfare	<u>4.40</u>	<u>4.40</u>	<u>4.40</u>
Pension	<u>1.25</u>	<u>1.25</u>	<u>1.25</u>
Apprenticeship	<u>1.34</u>	<u>1.52</u>	<u>.69</u>
Other	<u>3.51</u>	<u>4.15</u>	<u>4.80</u>
8. Payroll Taxes (FICA, FUI, SUI) <u>17</u> percent of line 3	<u>4.74</u>	<u>7.10</u>	<u>9.47</u>
9. Workmens' Compensation + <u>General Liability</u> <u>5</u> percent of line 3	<u>1.53</u>	<u>2.30</u>	<u>3.07</u>
10. Total Hourly Direct Labor Rate	<u>47.39</u>	<u>65.65</u>	<u>83.91</u>
(Total Hourly Labor Rate shall be the basis for the fixed percentage markup.)			
11. Premium Portion of Overtime	<u>0</u>	<u>18.26</u>	<u>36.52</u>

(No markup is allowed on premium portion of overtime.)

PART C - DIVISION C3

WAGE BREAKDOWN FORM FOR TIME AND MATERIAL WORKHourly Payroll Cost Calculations

The bidder shall complete one (1) copy of this Wage Breakdown Form for each craft and each level of personnel anticipated to be utilized in performing the Work including Foreman, Journeyman, Apprentices, etc., as shown within the bidder's proposed organizational chart.

Craft: Electrical Local Union (if applicable): 354

Title: Foreman Location: Delta, Utah

These rates effective from 1/1/05 to 5/31/05

		<u>Straight Time</u>	<u>Time & a Half</u>	<u>Double Time</u>
1.	Base Rate	<u>26.24</u>	<u>39.35</u>	<u>52.47</u>
2.	Vacation (if applicable)	<u>0</u>	<u>0</u>	<u>0</u>
3.	Subtotal - Fee Base	<u>26.24</u>	<u>39.35</u>	<u>52.47</u>
4.	Subsistence	<u>3.00</u>	<u>3.00</u>	<u>3.00</u>
5.	Travel Pay	<u>0</u>	<u>0</u>	<u>0</u>
6.	Subtotal	<u>29.24</u>	<u>42.35</u>	<u>55.47</u>
7.	Union Contributions (if applicable):			
	Health and Welfare	<u>4.40</u>	<u>4.40</u>	<u>4.40</u>
	Pension	<u>1.25</u>	<u>1.25</u>	<u>1.25</u>
	Apprenticeship	<u>.31</u>	<u>.47</u>	<u>.63</u>
	Other	<u>3.40</u>	<u>3.99</u>	<u>4.58</u>
8.	Payroll Taxes (FICA, FUI, SUI) <u>17</u> percent of line 3	<u>4.34</u>	<u>6.51</u>	<u>8.68</u>
9.	Workmens' Compensation <u>5</u> percent of line 3	<u>1.41</u>	<u>2.11</u>	<u>2.81</u>
	+ General Liability			
10.	Total Hourly Direct Labor Rate	<u>44.35</u>	<u>61.07</u>	<u>77.33</u>
(Total Hourly Labor Rate shall be the basis for the fixed percentage markup.)				
11.	Premium Portion of Overtime	<u>0</u>	<u>16.74</u>	<u>33.48</u>

(No markup is allowed on premium portion of overtime.)

PART C - DIVISION C3

WAGE BREAKDOWN FORM FOR TIME AND MATERIAL WORK

Hourly Payroll Cost Calculations

The bidder shall complete one (1) copy of this Wage Breakdown Form for each craft and each level of personnel anticipated to be utilized in performing the Work including Foreman, Journeyman, Apprentice, etc., as shown within the bidder's proposed organizational chart.

Craft: Electrical Local Union (if applicable): 354
 Title: Journeyman Location: DETA, Utah
 These rates effective from 1/1/05 to 5/31/05

		<u>Straight Time</u>	<u>Time & a Half</u>	<u>Double Time</u>
1.	Base Rate	<u>32.85</u>	<u>35.78</u>	<u>47.70</u>
2.	Vacation (if applicable)	<u>0</u>	<u>0</u>	<u>0</u>
3.	Subtotal - Fee Base	<u>32.85</u>	<u>35.78</u>	<u>47.70</u>
4.	Subsistence	<u>3.00</u>	<u>3.00</u>	<u>3.00</u>
5.	Travel Pay	<u>0</u>	<u>0</u>	<u>0</u>
6.	Subtotal	<u>26.85</u>	<u>38.78</u>	<u>50.70</u>
7.	Union Contributions (if applicable):			
	Health and Welfare	<u>4.40</u>	<u>4.40</u>	<u>4.40</u>
	Pension	<u>1.25</u>	<u>1.25</u>	<u>1.25</u>
	Apprenticeship	<u>.39</u>	<u>.43</u>	<u>.57</u>
	Other	<u>3.29</u>	<u>3.23</u>	<u>4.37</u>
8.	Payroll Taxes (FICA, FUI, SUI) <u>17</u> percent of line 3	<u>3.95</u>	<u>5.92</u>	<u>7.89</u>
9.	Workmens' Compensation + <u>General Liability</u> <u>5</u> percent of line 3	<u>1.23</u>	<u>1.92</u>	<u>2.56</u>
10.	Total Hourly Direct Labor Rate	<u>41.30</u>	<u>56.52</u>	<u>71.74</u>
(Total Hourly Labor Rate shall be the basis for the fixed percentage markup.)				
11.	Premium Portion of Overtime	<u>0</u>	<u>15.22</u>	<u>30.44</u>

(No markup is allowed on premium portion of overtime.)

PART C - DIVISION C3WAGE BREAKDOWN FORM FOR TIME AND MATERIAL WORKHourly Payroll Cost Calculations

The bidder shall complete one (1) copy of this Wage Breakdown Form for each craft and each level of personnel anticipated to be utilized in performing the Work including Foreman, Journeyman, Apprentice, etc., as shown within the bidder's proposed organizational chart.

Craft: Electrical Local Union (if applicable): 354

Title: Apprentice 5 Location: DELTA, Utah

These rates effective from 1/1/05 to 5/31/05

	<u>Straight Time</u>	<u>Time & a Half</u>	<u>Double Time</u>
1. Base Rate	<u>16.74</u>	<u>25.11</u>	<u>33.48</u>
2. Vacation (if applicable)	<u>0</u>	<u>0</u>	<u>0</u>
3. Subtotal - Fee Base	<u>16.74</u>	<u>25.11</u>	<u>33.48</u>
4. Subsistence	<u>3.00</u>	<u>3.00</u>	<u>3.00</u>
5. Travel Pay	<u>0</u>	<u>0</u>	<u>0</u>
6. Subtotal	<u>19.74</u>	<u>28.11</u>	<u>36.48</u>
7. Union Contributions (if applicable):			
Health and Welfare	<u>4.40</u>	<u>4.40</u>	<u>4.40</u>
Pension	<u>0</u>	<u>0</u>	<u>0</u>
Apprenticeship	<u>.20</u>	<u>.30</u>	<u>.40</u>
Other	<u>1.22</u>	<u>1.60</u>	<u>1.98</u>
8. Payroll Taxes (FICA, FUI, SUI)			
<u>17</u> percent of line 3	<u>2.77</u>	<u>4.16</u>	<u>5.54</u>
9. Workmens' Compensation + <u>General Liability</u>			
<u>5</u> percent of line 3	<u>.90</u>	<u>1.35</u>	<u>1.79</u>
10. Total Hourly Direct Labor Rate	<u>29.23</u>	<u>39.91</u>	<u>50.60</u>
(Total Hourly Labor Rate shall be the basis for the fixed percentage markup.)			
11. Premium Portion of Overtime	<u>0</u>	<u>10.68</u>	<u>21.37</u>

(No markup is allowed on premium portion of overtime.)

PART C - DIVISION C4FIXED PERCENTAGE MARKUPS FOR TIME AND MATERIAL WORK

1. Percentage Markup for Labor: The bidder hereby proposes to furnish all required craft labor and site supervision at the rates detailed in the Wage Breakdown Forms plus the fixed percentage markup of 14.6 percent. This markup shall constitute full compensation for profit, overhead, insurance, expense for small tools and light equipment with a new unit cost of less than Six Hundred Fifty Dollars (\$650), safety equipment, safety training, safety testing, and all other elements of cost not defined herein as actual direct costs. Hourly payroll cost for site office clerk/secretarial labor shall be the flat hourly rate shown in the applicable Wage Breakdown Form, with no markup applied.
2. Percentage Markup for Materials: The bidder hereby proposes to furnish all materials as directed by IPSC, throughout the course of the Work at actual direct cost plus the fixed percentage markup of 12 percent. This markup shall constitute full compensation for acquisition of materials as directed and approved by IPSC.
3. Percentage Markup for Subcontractor Work: The bidder hereby proposes to furnish all required subcontractor work, as directed and approved by IPSC, at the actual direct cost to the bidder plus the fixed percentage markup of 10 percent. The fixed percentage markup of any subcontractor shall not be more than 10 percent higher than the bidder's percentage markup on labor as shown in Article 1 above, e.g., if the bidder's percentage markup for labor is 2 percent, the subcontractor's markup shall not be more than 2.2 percent total. The bidder's markup of the subcontractor's invoice shall constitute full compensation for all costs associated with acquiring, directing, coordinating, processing, controlling, and ensuring acceptable completion of the subcontractor's work. The subcontractor's markup shall constitute full compensation for the subcontractor's profit, field office expense, overheads, safety equipment, safety training, safety testing, and all other elements of cost not defined as actual direct costs.
4. Percentage Markup for Equipment: The bidder hereby proposes to furnish all required equipment, with a new unit cost in excess of Six Hundred Fifty (\$650), as approved by IPSC, for the fixed percentage markup of 10 percent. This markup shall be applied to the bidder's actual weekly equipment rental rate. Where the bidder is required to purchase the equipment, the bidder shall be reimbursed at an average weekly rental rate plus the above specified percentage. The average weekly rental rate shall be the average of rates obtained by IPSC from three (3) local equipment rental companies.

PART C - DIVISION C5**EQUIPMENT RENTAL RATES FOR TIME AND MATERIAL WORK**

In the event that required equipment is not available through IPSC, the equipment shall be rented by Contractor and charged to IPSC at the following direct cost rental rate:

	<u>Cost per Item</u>		
	<u>Daily</u>	<u>Monthly</u>	<u>Mobilization</u>
<u>Demobilization</u>	<i>Please see attached</i>		
Dump Truck (10 yd with plow)			
Front-End Loader (4 yd bucket)			
Backhoe (Case 580 or equal)			
Motor Grader (Cat 12G or equal)			
Pickup Truck (2 wd - 1/2 ton)			
Pickup Truck (4 wd - 3/4 ton)			
Rough-Terrain Crane (15 ton)			
Truck Crane (80 ton hydraulic)			
Flatbed Truck (1-1/2 ton)			
Forklift (6,000 lb high-lift)			
Air Compressor (125 cfm)			
Generator (30 kVA)			
Portable Toilet			
Other _____			
Other _____			
Other _____			

Operator costs shall be covered as direct labor based on the hourly payroll cost calculation sheets. The fixed percentage markups for equipment, quoted on page C4-1, shall not be applied to the rates quoted above.



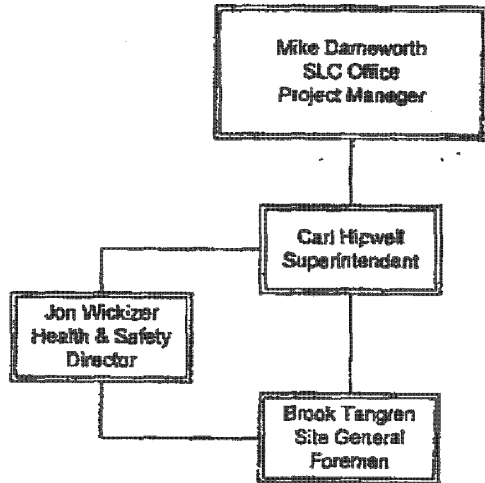
Cache Valley Electric Co.
919 North 1000 West
Logan, Utah 84321


Phone (435) 752-6405
Fax (435) 752-9111

EQUIPMENT RATES

	<u>DAY</u>	<u>WEEK</u>	<u>MONTH</u>
28 TON CRANE	\$210.00	\$1,050.00	\$4,200.00
45 TON CRANE	\$310.00	\$1,550.00	\$6,200.00
TRACK HOE	\$200.00	\$1,000.00	\$4,000.00
BACK HOE	\$110.00	\$550.00	\$2,200.00
DOZER (TD-8)	\$135.00	\$675.00	\$2,700.00
TRENCHER (SMALL)	\$50.00	\$250.00	\$1,000.00
TRENCHER (LARGE)	\$100.00	\$500.00	\$2,000.00
SKID STEER	\$75.00	\$375.00	\$1,500.00
ROLLER COMPACTOR	\$92.50	\$462.50	\$1,850.00
TAMPER	\$27.50	\$137.50	\$550.00
6 X 6 REEL TRUCK	\$100.00	\$500.00	\$2,000.00
AIR COMPRESSOR	\$25.00	\$125.00	\$500.00
WINCH TRUCK/14TON CRANE	\$175.00	\$875.00	\$3,500.00
BUCKET TRUCK-HIGH RANGER	\$175.00	\$875.00	\$3,500.00
DUMP TRUCK	\$100.00	\$500.00	\$2,000.00
AUGER TRUCK	\$175.00	\$875.00	\$3,500.00
FORK LIFT	\$115.00	\$575.00	\$2,300.00
LIGHT TOWER	\$50.00	\$250.00	\$1,000.00
MAN LIFT 110'	\$500.00	\$2,500.00	\$10,000.00
MAN LIFT 80'	\$265.00	\$1,325.00	\$5,300.00
MAN LIFT 60'	\$160.00	\$800.00	\$3,200.00
MAN LIFT 40'	\$100.00	\$500.00	\$2,000.00
SCISSOR LIFT 20'	\$66.00	\$330.00	\$1,320.00
6 X 6 REEL TRUCK	\$40.00	\$200.00	\$800.00
SERVICE TRUCK	\$20.00	\$100.00	\$400.00
WELDER	\$20.00	\$100.00	\$400.00
PORTABLE GENERATOR	\$15.00	\$75.00	\$300.00
PICK-UP TRUCK	\$20.00	\$100.00	\$500.00
OFFICE TRAILER	\$30.00	\$150.00	\$600.00
CONEX/STORAGE	\$7.50	\$37.50	\$150.00
SEMI TRAILER/TOOL TRAILER	\$7.50	\$37.50	\$150.00
MAN HOLE VENTALTION	\$12.50	\$62.50	\$250.00
HI-POTTER	\$75.00	\$375.00	\$1,500.00
TUGGER	\$22.50	\$112.50	\$450.00
½" TO 2" THREADER	\$17.50	\$87.50	\$350.00
2" TO 4" THREADER	\$27.50	\$137.50	\$550.00
6" THREADER	\$32.50	\$162.50	\$650.00
½" TO 2" BENDER	\$12.50	\$62.50	\$250.00
2" TO 4" BENDER	\$22.50	\$112.50	\$450.00
6" BENDER	\$55.00	\$275.00	\$1,100.00
PORTA PONY	\$10.00	\$50.00	\$200.00
PORTABLE TOOL TRAILER	\$62.50	\$312.50	\$1,250.00
½" TO 2" PVC BENDER	\$5.00	\$25.00	\$100.00
2" TO 4" PVC BENDER	\$15.00	\$75.00	\$300.00
BAND SAW	\$25.00	\$125.00	\$500.00
CUTTING TORCH	\$5.00	\$25.00	\$100.00
HILTI TE-74	\$7.50	\$37.50	\$150.00
RADIOS	\$3.75	\$18.75	\$75.00

IP7011813



Intermountain Power Service Corp. Electrical Construction Work Spec 45852	Cache Valley Electric Organizational Chart			 Cache Valley Electric Co. 2345 S. John Henry Dr. Salt Lake City, UT 84119
		1/25/05		

PART D - DIVISION D1

CONTRACT DOCUMENTS DESCRIPTION

The Contract Agreement, together with the documents listed in the Table of Contents, thereof, the Reference Specifications, any other documents listed below, and such of the Contractor's Proposal documents as are expressly agreed to by IPSC shall constitute the Contract (the Contract). Said documents are complementary and require complete and finished Work. Anything shown or required of Contractor in any one or more of said documents shall be as binding as if contained in all of said documents. Contractor shall not be allowed to take advantage of any error, discrepancy, omission, or ambiguity in any document, but shall immediately report to the President and Chief Operations Officer, in writing, any such matter discovered. The President and Chief Operations Officer will then decide or correct the same and the decision will be final.

PART E - DIVISION E1

GENERAL CONDITIONS

1. **Definitions:** The following words shall have the following meanings:
 - a. **Bidder:** The person, firm, or corporation adopting and submitting a Proposal under these Specifications.
 - b. **Buyer:** The Purchasing Agent for IPSC.
 - c. **Contract Administrator:** The IPSC employee designated by the President and Chief Operations Officer with primary responsibility for administration of the Contract, or other representatives designated by the Contract Administrator acting within the limits of their authority.
 - d. **Contractor:** The person, firm, or corporation to whom the Contract is awarded.
 - e. **Directed, Required, Approved, etc.:** The words *directed, required, approved, permitted, ordered, designated, prescribed, instructed, acceptable, accepted, satisfactory*, or similar words shall refer to actions, expressions, and prerogatives of the Contract Administrator unless otherwise expressly stated.
 - f. **Gallon:** Liquid volume of 231 cubic inches at 60 degrees Fahrenheit.
 - g. **IGS:** Intermountain Generating Station located at 850 West Brush Wellman Road, Delta, Utah 84624.
 - h. **IPA:** Intermountain Power Agency, the owner of Intermountain Power Project, and a political subdivision of the state of Utah, organized and existing under the Interlocal Co-Operation Act, Title 11, Chapter 13, Utah Code Annotated 1953, as amended.
 - i. **IPP:** Intermountain Power Project, consisting of Intermountain Generating Station, Intermountain Railcar, Intermountain Converter Station, Adelanto Converter Station, Intermountain AC Switchyard and associated transmission lines, microwave stations, and support facilities.
 - j. **IPSC:** Intermountain Power Service Corporation, a nonprofit corporation, furnishing personnel to support the Operating Agent in the performance of operation and maintenance.
 - k. **Operating Agent, or LADWP:** The City of Los Angeles Department of Water and Power which is responsible for operation and maintenance for IPP.

DIVISION E1

GENERAL CONDITIONS

- i. President and Chief Operations Officer: The President and Chief Operations Officer of IPSC, or other representatives designated by the President and Chief Operations Officer acting within the limits of their authority.
 - m. Project Coordinator: The IPSC employee designated by the President and Chief Operations Officer with primary responsibility for coordination of a given project, including acting as liaison between IPSC and Contractor.
 - n. Reference Specifications: Those bulletins, standards, rules, methods of analysis or tests, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in these Specifications. These refer to the latest edition, including amendments published and in effect at the date of the Invitation for Proposal, unless specifically referred to by edition, volume, or date. Unless the context otherwise requires, Reference Specifications also include all amendments published or adopted after the date of the Invitation for Proposal.
 - o. Subcontractor: A person, firm, or corporation, other than the Contractor and employees thereof, who supplies labor, services, or materials for a portion of the Work to be performed by the Contractor under this Contract.
 - p. Ton: The short ton of 2,000 pounds.
 - q. Work: The services, materials, equipment, and other performance identified in these Specifications and other Contract Documents to be provided by Contractor.
- 2. Materials and Work: All Work shall comply with these Specifications. All materials used or supplied, and all equipment furnished, shall be new and unused, but this requirement shall not preclude the use of recycled materials in the manufacturing processes. All Work shall be done by qualified workers in a thorough and workmanlike manner that would pass without objection in both Contractor's trade and IPSC's and IPA's industry. Materials, equipment, workmanship, and other Work not definitely specified, but incidental to and necessary for the Work, shall conform to the best commercial practice for the type of Work in question and be of a quality that passes without objection in Contractor's trade and IPSC's and IPA's industry.
- 3. Nondiscrimination: The applicable provisions of Executive Order No. 11246 of September 24, 1965, and Bureau of Land Management regulations, and all other applicable governmental regulations pertaining to nondiscrimination in employment in the performance of contracts, are incorporated herein by reference, and made a part hereof as if they were fully set forth herein. During the performance of the Contract, Contractor shall not discriminate in its employment practices against any employee or applicant for employment because of the employee's or applicant's race, religion,

DIVISION E1

GENERAL CONDITIONS

national origin, ancestry, sex, age, or physical disability. All subcontracts awarded pursuant to the Contract shall contain a like nondiscrimination provision.

4. Governing Law; Venue: The Contract shall be governed by the substantive laws of the state of Utah, regardless of any rules on conflicts of laws or choice of law that would otherwise cause a court to apply the laws of any other state or jurisdiction. Any action, in law or in equity, concerning any alleged breach of or interpretation of the Contract, or concerning any tort in relation to the Contract or incidental to performance under the Contract, shall be filed only in the state or federal courts located in the state of Utah.
5. Patents and Intellectual Property: Contractor shall fully indemnify and, at the election of IPA, defend IPSC, IPA, and the Operating Agent against any and all liability, whatsoever, by reason of any alleged infringement of any intellectual property rights (including, but not limited to, patents, copyrights, trademarks, or trade secrets) on any article, process, method, or application used in any designs, plans, or specifications provided under the Contract, or by reason of Contractor's manner of performance under the Contract, or by reason of use by IPA, IPSC, or the Operating Agent of any article, process, or material specified by Contractor.
6. Contractor's Address and Legal Service: The address given in the Proposal shall be considered the legal address of Contractor and shall be changed only by advance written notice to IPSC. Contractor shall supply an address to which certified mail can be delivered. The delivery of any written communication to Contractor personally, or delivery to such address, or the depositing in the United States Mail, registered or certified with postage prepaid addressed to Contractor at such address, shall constitute a legal service thereof.
7. Assignment of Contract Prohibited: Contractor shall not assign or otherwise attempt to dispose of the Contract, or any rights hereunder, or of any monies due or to become due hereunder, unless authorized by the prior written consent of the President and Chief Operations Officer. The Contract, and Contractor's rights hereunder (including rights of collection) are nonassignable without the President and Chief Operations Officer's prior written consent. No right or claim can be asserted against IPA, IPSC, or the Operating Agent, in law or equity, by any person, by reason of any assignment or disposition unless so authorized.

If Contractor, without such prior written consent, purports to assign or dispose of the Contract, or any right or interest hereunder, IPSC may at its option terminate the Contract. Such termination shall relieve and discharge IPA, IPSC, and the Operating Agent from any and all liability, duties, and obligations to Contractor, and to any assignee or transferee thereof.

8. Quality Assurance: IPSC has the right to subject any or all materials, services, equipment, or other Work furnished and delivered under the Contract to rigorous

DIVISION E1

GENERAL CONDITIONS

inspection and testing. (Unless otherwise specifically provided in the Contract with respect to specific materials, services, equipment, or other Work, IPSC has no duty to inspect, test, or specifically accept.) Before offering any material, services, equipment, or other Work for inspection, testing, delivery, or acceptance, Contractor shall eliminate all items or portions which are defective or do not meet the requirements of these Specifications. If any items or portions are found not to meet the requirements of these Specifications, the lot, or any faulty portion thereof, may be rejected. Only the Contract Administrator may accept any material, service, equipment, or other Work as complying with these Specifications on behalf of IPSC.

IPSC may inspect and reject materials, services, equipment, or other Work tendered or purchased under the Contract at any reasonable location IPSC may choose (including, but not limited to, points of origin, while in transit to IPSC, IPSC specified receiving points, IPSC storage sites, or any point of use or installation). Inspection can include any testing that IPSC deems necessary or convenient to determine compliance with these Specifications. The expense of any initial tests will be borne by IPSC. All expenses of subsequent or additional tests will be charged against Contractor when due to failure of first-offered materials, services, equipment, or other Work to comply with these Specifications.

The fact that the materials, services, equipment, or other Work have or have not been inspected, tested, or accepted by IPSC, whether voluntarily or as required by any specific provision in the Contract, shall not relieve Contractor of responsibility in case of later discovery of nonconformity, flaws, or defects, whether patent or latent.

9. Extra Work, Reduced Work, and Change Orders by IPSC: IPSC reserves the right at any time before final acceptance of the entire Work to order Contractor to furnish or perform extra Work, or to make changes altering, adding to, or deducting from the Work, without invalidating the Contract. Changes shall not be binding upon either IPSC or Contractor unless made in writing in accordance with this Article.

Changes will originate with the President and Chief Operations Officer who will transmit to Contractor a written request for a Proposal covering the requested change, setting forth the changed Work in detail, and including any required supplemental plans or specifications. Upon receipt of such request, Contractor shall promptly submit in writing to the President and Chief Operations Officer a Proposal offering to perform such change, a request for any required extension of time caused by such change, and an itemized statement of the cost or credit for the proposed change. Failure of Contractor to include a request for extension of time in the Proposal shall constitute conclusive evidence that such extra Work or revisions will entail no delay and that no extension of time will be required.

If Contractor's Proposal is accepted by IPSC, a written change order will be issued by the President and Chief Operations Officer stating that the extra Work or change is

DIVISION E1

GENERAL CONDITIONS

authorized and granting any required adjustments of the Contract price and of time of completion. If Contractor's Proposal is rejected by IPSC, then IPSC may order the additional or changed Work from other vendors.

Additional Work or changes pursuant to the change order shall be performed in accordance with the terms and conditions of these Specifications. No extra Work shall be performed or change made unless pursuant to such written change order, and no claim for an addition to the Contract price shall be valid unless so ordered.

Notwithstanding anything in the preceding paragraphs to this Article, IPSC may issue a written order reducing the Scope of Work without issuing a request for Proposal. Any such reduction in the Scope of Work shall be effective upon issuance. Reductions ordered by IPSC shall constitute partial terminations and shall reduce the price to be paid by IPSC.

10. Changes at Request of Contractor: Changes may be made to facilitate the Work of Contractor. Such changes may only be made without additional cost to IPSC, without extension of time, and pursuant to written permission from the President and Chief Operations Officer. Permission for such changes shall be requested in writing by Contractor to the President and Chief Operations Officer.
11. Time is of the Essence and Extensions of Time: Time is of the essence to the Contract. Delivery and other performance of Work must be completed within the times and by the dates specified. Time for delivery or other performance of Work shall not be extended except as provided in this Article. Failure to deliver or otherwise perform Work within the times and by the dates specified shall constitute a default and be grounds for IPSC to immediately terminate the Contract.

If Contractor makes a timely written request in accordance with this Article, the time for delivery or other performance of Work will be extended by a period of time equivalent to any delay in the whole Work which is: (a) authorized in writing by the President and Chief Operations Officer, (b) caused solely by IPSC, or (c) due to unforeseeable causes (such as war, strikes, or natural disasters) and which delay is beyond the control and without the fault or negligence of Contractor and subcontractors.

Contractor shall promptly notify the President and Chief Operations Officer in writing at both the beginning and ending of any delay, of its cause, its effect on the whole Work, and the extension of time claimed. Failure of Contractor to provide such written notices and to show such facts shall constitute conclusive evidence that no excusable delay has occurred and that no extension of time is required.

The President and Chief Operations Officer will ascertain the facts and the extent of the delay and will extend the time for delivery and completion of Work when the findings of fact justify such an extension. The President and Chief Operations Officer's determination will be final and conclusive.

DIVISION E1

GENERAL CONDITIONS

IPSC will be responsible for granting extensions of time as herein provided, but will not otherwise be responsible in any manner or liable to any extent for damage directly or indirectly suffered by Contractor as a result of any delay.

12. Protests and Claims: If Contractor considers any demand of the President and Chief Operations Officer to be outside of the requirements of the Contract, or considers any amount of payment, or any record, ruling, or other act, omission, or determination by the President and Chief Operations Officer to be unreasonable, Contractor shall promptly deliver to the President and Chief Operations Officer a written statement of the protest and of the amount of compensation or nature of accommodation, if any, claimed.

Upon written request by the President and Chief Operations Officer, Contractor shall provide access to all records containing any evidence relating to the claim or protest.

Upon review of the protest, claim, and evidence, the President and Chief Operations Officer will promptly advise Contractor in writing of the final decision which will be binding on all parties.

The requirements of this Article shall be in addition to, and shall not be construed as waiving claims provisions of the Statutes of the state of Utah. Contractor is deemed to have waived and does waive all claims for extensions of time and for compensation in addition to the Contract price except for protests and claims made and determined in accordance with this Article.

13. Sole Responsible Party: It is understood and agreed that IPA shall be the sole party or person liable to Contractor for payments under or pursuant to the Contract, and for any breaches, defaults, or for any torts in the performance of or in relation to the Contract by IPA, IPSC, or the Operating Agent, or any officers, agents, or employees thereof. Contractor hereby expressly covenants and agrees that no suit shall be brought by Contractor against IPSC, or the Operating Agent, or their, or IPA's officers, agents, or employees, or any of the purchasers of power from IPA, but that all rights or remedies that Contractor may have or that may arise under or in relation to the Contract shall be asserted by Contractor solely against IPA. Without limiting the foregoing provisions of this Article, Contractor shall have no right against any of the foregoing (including IPA) to assert or recover, in contract or in tort, damages or losses in the nature of consequential damages, incidental damages, or punitive or exemplary damages.
14. Independent Contractor: Contractor shall perform the Work as an independent contractor in the pursuit of its independent calling. Contractor is not an employee, agent, joint venturer, partner, or other representative of IPA, IPSC, or the Operating Agent and shall be under the control of IPSC only to provide the services requested and not as to the means or manner by which the Work is to be accomplished. Contractor has no authority to act for, bind, or legally commit IPA, IPSC, or the Operating Agent in any way.

DIVISION E1

GENERAL CONDITIONS

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15. Drug Policy: Contractor shall submit a current copy of its drug policy. IPP facilities are a drug free and zero tolerance workplace. Contractor's employees and its subcontractors' employees, who are to perform Work or otherwise be at the IPP facilities, shall participate in Contractor's drug testing program prior to arrival, and at any additional time(s) during the Contract as IPSC may request.
16. Security and Safety Compliance: Contractor and its employees, agents, representatives, and/or subcontractors, while performing Work on IPP premises, or who are otherwise on IPP premises, shall fully comply with all security, fire prevention, and safety rules and procedures in force at IPP. IPSC has the right (but not duty) to make periodic and random inspections of the persons, and of their respective property, upon entering, at any time while on, and when departing any IPP facility. Such persons subject to inspection include Contractor, any subcontractor, and their respective employees, agents, and representatives. Property subject to inspection includes, but is not limited to, vehicles, clothing, toolboxes, lunch boxes, any other carrying case, tools or equipment, and anything contained therein. If violations are noted, the violations will be reported to Contractor's on-site supervisor and the Contract Administrator for appropriate action.

All Contractor's employees will be given security identification badges by IPSC and those badges shall be displayed each day to allow admittance on IPP premises. Contractor's employees who do not have security identification badges in their possession, will not be allowed on site unless signed in by the Contract Administrator. All security identification badges shall be returned to the Security Contractor when the employee terminates their work at this site. All Contractor's vehicles will also receive parking stickers from the Security Contractor allowing entrance on IPP premises. Temporary badges and parking stickers are available for intermittent Contractor's employees and vehicles.

Contractor shall have access on IPP premises between the hours of 7:00 am to 7:00 pm Monday through Friday. Access may be allowed on weekends or at other times with the approval of the Contract Administrator.

Contractor will be directed to specified areas for parking vehicles and equipment by the Contract Administrator. Certain areas of IPP premises are restricted to IPSC vehicles only. Exceptions to the parking restriction will be made on an as needed basis through Contractor's respective Contract Administrator. Contractor shall make its employees, agents, representatives, and/or subcontractors aware of all areas that are subject to restricted parking.

Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use areas for parking or storage of materials.

DIVISION E1

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Contractor agrees, warrants, and represents that: (a) it is familiar with the risks of injury associated with the Work and otherwise being on IPP premises, (b) has reviewed the Work to be performed, (c) has inspected the IPP Work site with an IPSC representative, and (d) has determined that no unusual or peculiar risk of harm exists with regard to the Work to be performed on IPP premises. Contractor further agrees that it shall, at all times, provide on IPP premises, a competent supervisor(s) familiar with IPSC's and the industry's safety standards to ensure compliance with all federal, state, and local regulations pertaining to safety (including, but not limited to, Federal and State OSHA, as said regulations relate to the Work to be performed under the Contract). Although IPSC assumes no responsibility to oversee or supervise the Work, IPSC reserves the right to review safety programs and practices and to make recommendations to Contractor. No such review or recommendation by IPSC shall impose any liability or responsibility on IPSC, or relieve Contractor from providing a safe working environment and complying with all legal requirements.

Contractor shall comply with IPSC's safety and equipment requirements prior to starting the Work. Worker protective clothing, which includes, but is not limited to, hardhats, safety glasses, safety shoes, gloves, respirators, earplugs, safety harnesses, and face shields shall be provided by Contractor.

Prior to starting the Work, all of Contractor's personnel shall attend a safety orientation taught by a representative of IPSC. At Contractor's option and subject to IPSC approval, a supervisor of Contractor may attend the orientation taught by IPSC, and then present the orientation to the remainder of Contractor's personnel. In that case, a roll shall be provided to IPSC which lists each person who received the orientation and the date it was received.

17. Nonexclusive: This is a nonexclusive Contract. IPSC reserves the right to obtain services, materials, equipment, or other Work from additional contractors or suppliers.
18. Confidential Information: These Specifications, drawings, designs, manufacturing data, and any other information transmitted to Contractor by IPSC in connection with the performance of the Contract are the property of IPSC and are disclosed in confidence upon the condition that, and Contractor's agreement that, they are not to be reproduced or copied, or used for furnishing information or equipment to others, or for any other purpose.

PART E - DIVISION E2

ADDITIONAL GENERAL CONDITIONS

1. **Guarantee:** Contractor guarantees and warrants for a minimum period of one (1) year after final acceptance of the last item of Work under this Contract, and for such longer period as may be specified by the applicable statute of limitations, that all services, materials, equipment, and other Work furnished are free from defects and otherwise conform to the terms of the Contract, including, but not limited to, the Article entitled "Materials and Work" in Part E, Division E1, Article 2, General Conditions.

Contractor shall repair or replace, as IPSC may direct, all defective services, materials, equipment, or other Work. Such repair or replacement shall be F.O.B. at such destination as IPSC may direct (e.g., contract delivery point, point of installation, point of consumption, etc). IPSC's right to require repair or replacement is in addition to any other remedies that may be available for breach of the foregoing guarantees and warranties.

Contractor shall, for the protection and benefit of IPA, IPSC, and LADWP, obtain guarantees conforming to the foregoing two paragraphs from each of its vendors and subcontractors with respect to their material, equipment, services, or other portion of the Work. Such guarantees from vendors and subcontractors shall be in addition to, and not in lieu of, Contractor's own guarantees.

2. **Payment for Fixed Price Work:** On or about the first day of each month, Contractor shall submit an estimate of the value of the fixed price Work done during the previous calendar month. Based upon agreement with the Contract Administrator on the estimated value of the fixed price Work completed, Contractor shall prepare and submit a monthly progress payment invoice. As determined by the Contract Administrator, the estimated cost of repairing, replacing, or rebuilding a part of the fixed price Work or replacing materials which do not conform to the Contract Documents will be deducted from the estimated value. Contractor shall furnish to the Contract Administrator, such detailed information as the Contract Administrator may need to verify the monthly estimates.

Payment will be made within thirty (30) calendar days after delivery, acceptance, and receipt of the invoice.

Invoices shall be submitted in duplicate to Accounts Payable, Intermountain Power Service Corporation, 850 West Brush Wellman Road, Delta, UT 84624-9546. All letters pertaining to invoices shall be addressed to the foregoing address.

In all cases, the amount of the applicable sales tax or use tax shall be separately stated on the invoice.

3. **Payments for Time and Material Work:** Payment will be based on Contractor's monthly payment request accompanied by Contractor's materials itemization list(s) and daily

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time sheets, signed by IPSC, showing all man-hours. These time sheets shall indicate the craft classification, number of craftsmen, and hours worked.

As determined by IPSC, the estimated cost of repairing, replacing, or rebuilding any part of the Time and Material Work or replacing materials which do not conform to the Contract documents will be deducted from the records of costs.

All monthly payment requests for the Time and Material Work shall separately identify all sales and use taxes paid on goods and services required for the Work.

- a. Payment Schedule: Payment for the Work will be made in accordance with the following schedule:

On or about the first day of each month, after mobilization, Contractor shall submit, to the Contract Administrator, records of direct costs of labor and materials for the Work performed during the previous calendar month. Based upon agreement with the Contract Administrator on the costs submitted, Contractor shall prepare and submit, to the Contract Administrator, a monthly payment request.

Contractor shall furnish to IPSC such detailed information as IPSC may request to aid in the verification of the monthly payment request. Payment will be made within thirty (30) days of Contractor's payment request.

- b. Basis of Payment: Contractor will be reimbursed for actual direct costs of labor and materials furnished as part of the Work under the Contract plus the appropriate fixed percentage markup as quoted in the Proposal Section, Part C, Division C4, of the Contract. The fixed percentage markup will be paid as full compensation for Contractor's profit, general superintendence, field office expense (excluding office clerk/secretarial help for which a Wage Breakdown Form shall be included in the Proposal Section), safety equipment, safety training, safety testing, overheads, and all other elements of cost not defined herein as an actual direct cost. The actual direct cost shall include only those costs expended in direct performance of the Work. The quantities of all labor and materials provided shall be subject to the approval of IPSC at all times. The following categories shall be reimbursed as indicated. Each item eligible for reimbursement, in accordance with the following categories, shall be individually listed in Contractor's request for payment:

- (1) Actual man-hours expended in direct performance of the Work. Labor man-hours shall not include administrative and management staff above the level of general (second level) foreman.

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ADDITIONAL GENERAL CONDITIONS

- (2) Rental charges for equipment used in direct performance of the Work with a new cost above Six Hundred Fifty Dollars (\$650). All reimbursable, rental equipment shall be approved by the Project Coordinator prior to Contractor rental. Rental of equipment, quoted in the Proposal Section of the Contract, shall be charged to IPSC at the Contract unit prices quoted, without additional markup.
- (3) Rental charges for tools used in direct performance of the Work, with a value of Six Hundred Fifty Dollars (\$650) or more, with the approval of the Contract Administrator.
- (4) Cost of all consumables that Contractor is authorized to consume by the Project Coordinator. Consumables shall be reimbursed in the same manner as other materials. Examples of consumables include, but are not limited to:
 - (a) Sandblast Grit.
 - (b) Grinding/Sanding Discs.
 - (c) Solvents.
 - (d) Fuels.
 - (e) Lubricants.
- (5) Sales and use taxes paid on material goods.
- (6) All safety related equipment, tools, personal protective devices, training, and testing shall not be eligible for reimbursement but shall be contained within the bid Contractor labor markup. Examples of personal protective devices include, but are not limited to, the following:
 - (a) Work Gloves.
 - (b) Welders Gloves.
 - (c) Coveralls.
 - (d) Hardhats.
 - (e) Glasses.
 - (f) Respirators.

DIVISION E2

ADDITIONAL GENERAL CONDITIONS

The cost of materials and services which IPSC specifically directs Contractor to furnish on an actual direct cost basis will be reimbursed with the appropriate markup in accordance with quotes specified in the Proposal Section of the Contract.

Payment for the above items, except rental for equipment listed in the Proposal Section of the Contract, shall be based on Contractor's actual invoices and shall include the cost of transportation to job site, where applicable.

All costs for home office management and administration, overhead, profit, etc., are to be included in the labor markup. However, in any case, where the bidder intends to use home office personnel for labor and resource acquisition and allocation, a detailed Wage Breakdown Form must be provided for an "Office Contract Administrator." Direct labor provided by the Office Contract Administrator shall be shown on the daily labor invoice submitted to the IPSC Contract Administrator. Specific explanation of the Work accomplished by the Office Contract Administrator shall be provided with the daily invoice.

Labor costs for equipment repair shall not be reimbursed as a direct cost. Equipment repair costs shall be treated as overhead and included within the appropriate equipment percentage markup.

Travel costs for normal labor forces to and from the job site (if any) shall be shown as Travel Pay on the respective Wage Breakdown Form.

Reasonable cost for mobilization and demobilization of materials and equipment (including labor required for materials and equipment mobilization and demobilization) is to be considered reimbursable at the normal labor and equipment rental rates.

Purchase of all materials, including consumable materials, shall be authorized by the Project Coordinator in all cases. The Project Coordinator may often opt to supply these materials from IPSC inventories.

Rental of any tools or equipment with a new cost of more than Six Hundred Fifty Dollars (\$650) shall be authorized by the Project Coordinator in all cases. The Project Coordinator may often opt to supply the needed tools or equipment from IPSC inventories.

The cost of subcontracted work shall be based on actual subcontractors' invoices. Subcontractors' invoices shall be limited to actual direct costs as outlined above plus a fixed percentage as indicated in the Proposal Section. The subcontractors' percent markup shall be total compensation for the subcontractors' profit, general superintendence, field office expense, overheads,

DIVISION E2

ADDITIONAL GENERAL CONDITIONS

and all other elements of costs not defined as actual direct costs. No work shall be subcontracted by Contractor without the prior written approval of IPSC.

All of Contractor's records concerning subcontractors involved within the Contract shall be subject to audit by IPSC.

4. Final Payment: Before final payment for the Work by IPSC, Contractor shall submit to IPSC, written verification that all subcontractors, vendors, persons, or firms who have furnished labor or materials for the Work have been fully paid and that all taxes have been paid.

The unpaid balance due Contractor at the completion of the Work, adjusted according to any provision of the Contract, will be paid within thirty (30) days after receipt of Contractor's final monthly payment request and IPSC's official acceptance of the Work.

Payment to Contractor or subcontractors shall not constitute approval or acceptance of any part of the Work, and shall not relieve Contractor from any responsibility or liability for or related to the fulfillment of the Contract.

IPSC may refuse to approve the whole or any part of Contractor's monthly payment request, when, in the Contract Administrator's opinion, Contractor is either in violation of any of the provisions of the Contract or has submitted an incorrect payment request.

5. Progress Reports: Contractor shall furnish weekly progress reports to the Contract Administrator at the end of each week. The reports shall list the major accomplishments for the week and a list of the items scheduled for the following week. The report shall also update on a percentage basis the major milestones as outlined on the project schedule.
6. Regulations, Permits, Licenses, and Warrants: Contractor shall comply with all applicable federal, state, and local regulations including, but not limited to, Federal and State OSHA, as said regulations relate to the Contract, Contractor's performance, or Contractor's trade. In addition, Contractor shall ensure that all permits, licenses, and warrants relating to the Contract, Contractor's performance, and Contractor's trade be acquired.
7. Letters to IPSC: All inquiries relating to these Specifications prior to award of Contract shall be addressed to the Buyer.

After award of Contract, all letters pertaining to performance of the Contract (other than invoice) shall be addressed as follows:

DIVISION E2

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President and Chief Operations Officer
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, UT 84624-9546

Attention: Jon Christensen, Contract Administrator

Regarding Contract No. 05-45652

8. Contract Duration and Renewal Option: The Contract shall remain in force for a period of two (2) years from the date of award. Equitable adjustments to the labor and equipment rental rates quoted on pages C3-1 and C5-1 of Part C, Division C, Bidding Documents, may occur, at the request of Contractor, and with IPSC approval. Percentage adjustments shall be based upon Contractor's actual costs and shall not exceed the percentage increase implemented by IPSC for IPSC hourly employees effective January 1 of each year. No adjustments shall be allowed within the first twelve (12) months following Contract award.

IPSC shall have the right and option at anytime during the original Contractual Period to renew the Contract for a period of up to one (1) year after date of expiration of the original Contractual Period under the same terms and conditions for such extended or option period.

In the event that the Contract extension option is exercised by IPSC, it will be exercised by the issuance and delivery to Contractor of an order therefore by IPSC. The terms of this Contract executed for the original Contractual Period shall remain in effect for any such extended or option period.

9. Title: The title to all portions of the Work for which IPSC has made payments shall pass to IPA upon such payment, provided, however, that the risk of loss or damage with respect to the Work, including IPSC furnished equipment, of which Contractor has custody, shall be with Contractor until IPSC's official acceptance of the Work. When title to the Work, or portions thereof, passes to IPA, it shall be free of all liens and encumbrances. Passage of title shall not relieve Contractor of any responsibilities under the Contract.

PART F - DIVISION F1

DETAILED SPECIFICATIONS - SPECIAL CONDITIONS

1. **General:** Under the terms of the Contract, Contractor shall furnish and deliver **Electrical Construction Work** necessary to complete the Work as specified in the Contract Documents.
2. **Printed Documents:** All printed documents, including drawings and instruction books, if applicable, shall be in the English language. All units of measurement shall be in the English foot-pound-second system.
3. **Delivery Arrangements:** After award of the Contract and prior to performing any Work, Contractor shall become familiar with the facilities at the IPP premises set forth in the Proposal Schedule, either by personal inspection or by contacting the Contract Administrator, (435) 864-6481.
4. **Indemnity Clause:** Contractor undertakes and agrees to indemnify, hold harmless, and at the option of IPA, defend IPA, IPSC, LADWP, and any and all of their boards, officers, agents, representatives, employees, assigns, and successors in interest from and against any and all suits and causes of action, claims, charges, costs, damages, demands, expenses (including, but not limited to, reasonable attorneys' fees and cost of litigation), judgments, civil fines and penalties, liabilities or losses of any kind or nature, including, but not limited to, violations of regulatory law, breach of contract, death, bodily injury or personal injury to any person, including Contractor's employees and agents, or damage or destruction to any property of either party hereto, or of third persons, arising in any manner by reason of or incident to the performance of the Contract on the part of Contractor, or Contractor's officers, agents, employees, or subcontractors of any tier, except as may be caused by the sole negligence of IPA, IPSC, LADWP, or their boards, officers, agents, representatives, or employees.
5. **Insurance Requirements:** Prior to the start of the Work, but not later than thirty (30) calendar days after date of Award of Contract, Contractor shall furnish IPSC evidence of coverage from insurers acceptable to IPSC and in a form acceptable to IPSC's Insurance Analyst. Such insurance shall be maintained by Contractor and at Contractor's sole cost and expense.

Such insurance shall not limit or qualify the liabilities and obligations of Contractor assumed under the Contract. IPA, IPSC, or LADWP shall not, by reason of any of their inclusion under these policies or otherwise, incur liability to the insurance carrier for payment of the premium for these policies.

Any insurance carried by IPA, IPSC, or LADWP which may be applicable is and shall be deemed excess insurance, and Contractor's insurance is and shall be primary for all purposes despite any provision in Contractor's policies to the contrary.

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Should any portion of the required insurance be on a "Claims Made" policy, Contractor shall, prior to the policy expiration date following completion of the Work, provide evidence that the "Claims Made" policy has been renewed or replaced with the same limits and terms and conditions of the expiring policy at least for the Contract under which the Work was performed.

- a. Workers' Compensation/Employer's Liability: Workers' Compensation Insurance covering all of Contractor's employees in accordance with the laws of all states in which the Work is to be performed and including Employer's Liability Insurance, and as appropriate, Broad Form All States Endorsement, Voluntary Compensation, Longshoremen's and Harbor Workers' Compensation, Jones Act, and Outer-Continental Shelf coverages. The limit for Employer's Liability coverage shall be not less than \$1 million each accident and shall be a separate policy if not included with Workers' Compensation coverage. Evidence of such insurance shall be an endorsement to the policy providing for a thirty (30) days' prior written notice of cancellation or nonrenewal of a continuous policy to IPSC, by receipted delivery, and a Waiver of Subrogation in favor of IPA, IPSC, and LADWP, its officers, agents, and employees. Workers' Compensation/Employer's Liability exposure may be self-insured provided that IPSC is furnished with a copy of the certificate issued by the state authorizing Contractor to self-insure. Contractor shall notify IPSC, by receipted delivery, as soon as possible of the state withdrawing authority to self-insure.
- b. Commercial General Liability: Commercial General Liability with Blanket Contractual Liability, Products and Completed Operations, Broad Form Property Damage, Premises and Operations, Independent Contractors, and Personal Injury coverages included. Such insurance shall provide coverage for total limits actually arranged by Contractor, but not less than \$2 million Combined Single Limit and be specific for the Contract. Should the policy have an aggregate limit, such aggregate limits should not be less than \$4 million. Umbrella or Excess Liability coverages may be used to supplement primary coverages to meet the required limits. Evidence of such coverages shall be on IPSC's Additional Insured Endorsement Form or on an endorsement to the policy acceptable to IPSC and provide for the following:
 - (1) To include IPA, IPSC, LADWP, and their officers, agents, and employees as additional insured with the Named Insured for the activities and operations under and in connection with the Contract.
 - (2) That the insurance is primary and not contributing with any other insurance maintained by IPA, IPSC, or LADWP.
 - (3) A Severability-of-Interest of Cross-Liability Clause such as: "The policy to which this endorsement is attached shall apply separately to each insured

DIVISION F1

SPECIAL CONDITIONS

against whom a claim is made or suit is brought, except with respect to the limits of the company's liability."

- (4) That the policy shall not be subject to cancellation, change in coverage, reduction of limits, or nonrenewal of a continuous policy, except after written notice to IPSC, by receipted delivery, not less than thirty (30) days prior to the effective date thereof.
 - (5) A description of the coverages included under the policy.
- c. Commercial Automobile Liability: Commercial Automobile Liability covering the use of owned, nonowned, hired, and leased vehicles for total limits actually arranged by Contractor, but not less than \$1 million Combined Single Limit. Such insurance shall include Contractual Liability coverage. The method of providing evidence of insurance and requirements for additional insureds, primary insurance, notice of cancellation, and Severability-of-Interest shall be the same as required in the Commercial General Liability Section of these terms and conditions.
- d. Other Conditions:
 - (1) Failure to maintain and provide acceptable evidence of any of the required insurance for the required period of coverage shall constitute a major breach of Contract, upon which IPSC may immediately terminate or suspend the Contract. In addition or in the alternative, IPSC has the right (but no duty), to procure such insurance and (a) to submit a claim for the cost thereof against any Performance Bond supplied by Contractor, (b) to deduct the cost thereof from any monies due Contractor under the Contract or otherwise, and/or (c) to charge and collect the cost thereof from Contractor, payable upon demand. Such claim, deduction, or charge shall include an administrative fee of 2 percent of the cost of procuring said insurance. Said insurance may be procured and maintained in the name of Contractor, IPA, IPSC, LADWP, and/or any combination thereof, as primary and/or secondary insured, all as IPSC may from time to time elect.
 - (2) Contractor shall be responsible for all subcontractors' compliance with these insurance requirements. The foregoing remedies in subsection (1) shall be available to IPSC against Contractor for any failure by any subcontractor to maintain and provide the required insurance.
- 6. Transportation: All shipments of hazardous materials under the Contract or in connection herewith shall be handled in accordance with current U.S. Department of Transportation regulations and all other applicable federal, state, and local laws and regulations.

DIVISION F1

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7. Material Safety Data Sheets: Contractor shall furnish IPSC with a Material Safety Data Sheet (MSDS) for all hazardous materials furnished under the Contract, used, stored, or transported on or near IPP premises in connection with the Contract. The MSDS shall be furnished to IPSC on, or prior to, the date of the first delivery, use, storage, or transportation of the materials or equipment. If these Specifications require that Contractor furnish instruction books, the Material Safety Data Sheets shall also be included in such books.
8. Contract Termination:
- a. For Convenience or Security: IPSC reserves the right, by giving twenty (20) days' prior written notice (or such longer notice as IPSC may select) to Contractor, to terminate the whole or any part of the Contract at IPSC's convenience, whether or not Contractor is in default. IPSC also reserves the right to terminate the Contract, effective immediately upon notice, for purposes of security or safety of IPA or IPP facilities, persons who work at IPA or IPP facilities, or the public. In the event of termination for convenience, security, or safety, IPA will pay Contractor reasonable and proper termination costs (if, however, Contractor's Proposal includes cancellation charges, payment for termination costs shall not exceed the cancellation charges set forth therein). Contractor shall, after consultation with IPSC, take all reasonable steps to minimize the costs related to termination. Contractor shall provide IPSC with an accounting of costs claimed, including adequate supporting information and documentation and IPSC may, at its expense, audit the claimed costs and supporting information and documentation.
 - b. For Breach: IPSC may terminate the Contract, effective immediately upon notice in the event Contractor is in material default, and without right on the part of Contractor to claim any termination costs. This right to terminate is in addition to, and not in lieu of, any other remedy provided in the Contract or otherwise provided by law or equity.
 - c. Limitation of Liability: In no event shall termination of the Contract, whether for convenience, security, safety, breach, or otherwise, constitute the basis for or result in any claim for consequential damages (including loss of anticipated profits or other economic damages) or punitive damages, and Contractor hereby releases IPA, IPSC, and LADWP, and their officers, directors, employees, agents, and representatives, from any and all such claims or liability.
9. Suspension of Work: IPSC reserves the right to suspend and reinstate execution of the whole or any part of the Contract and Work without invalidating the provisions of the Contract. In the event Work is suspended, Contractor will be reimbursed for actual direct unavoidable costs that it reasonably incurs as a result of the suspension. Claims for such cost reimbursement shall be submitted by invoice. Contractor shall use all reasonable means to minimize such costs, and shall allow IPSC to audit costs claimed.

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Contractor shall, upon request by IPSC, provide a projection of costs it anticipates to incur during any suspension, or continuation of suspension, contemplated by IPSC. In no event shall suspension constitute the basis for, or result in, any claim for consequential damages (including loss of anticipated profits or other economic damages) or punitive damages, and Contractor hereby releases IPA, IPSC, and LADWP, and their officers, directors, employees, agents, and representatives, from any and all such claims or liability.

10. **No Waiver:** No breach, noncompliance, or other failure to perform (collectively "breach") by Contractor, or any subcontractor, or of any Work shall be deemed waived unless expressly waived in writing by the President and Chief Operations Officer. No waiver of any one breach by IPSC shall be deemed to waive any other prior, concurrent, or subsequent breach. No exercise, failure to exercise, or delay in exercising any particular remedy by IPSC shall be deemed a waiver or preclude IPSC from subsequently invoking that remedy for that breach or any other breach. All remedies granted to IPSC in the Contract, or by law or equity, are cumulative and may be exercised in any combination or order.
11. **Receiving, Handling, and Storing:** Contractor shall promptly receive, unload, and place into storage or construction all equipment, materials, and supplies needed for completion of the Contract including IPSC furnished materials and equipment.
 - a. **Receiving:** Upon arrival on IPP premises, Contractor shall examine all shipments for shortages, discrepancies, or damage. Contractor shall prepare a receiving report itemizing the material received and submit it to the Project Coordinator.
 - b. **Handling:** Contractor shall be responsible for any damage to equipment and materials while in Contractor's custody until final acceptance of the Work. Contractor shall unload all carriers promptly and shall pay any demurrage incurred. Materials shall be handled with due care to prevent damage or loss.
 - c. **Storage:** All equipment, materials, and supplies not immediately incorporated in the Work shall be placed in storage. Storage areas will be allocated and assigned by the Project Coordinator, and will be in the general area of the Work. The storage areas shall be kept clean and orderly at all times.

Contractor shall temporarily connect the motor space heaters for the fan motors to a 120-volt source while in storage and construction and until a permanent source is available.

12. **Construction Management:** Coordination of all field work will be under the direction of IPSC. In the event there are other contractors working on IPP premises, it will be IPSC's responsibility to coordinate the Work of all contractors and resolve any conflict. The IPSC Capital Project number is to be referenced on all daily time sheets and

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invoices that are submitted to IPSC for approval. Contractor shall be responsible for performing the Work in accordance with the dates shown on Contractor-prepared, IPSC-approved schedule.

Contractor shall prepare and submit to IPSC, a daily activities report which shall include a Contractor/Subcontractor Personnel Summary Report. The report shall be broken down into supervision and individual craft classifications. The report shall indicate the total number of personnel, by classification, on the payroll of Contractor and each subcontractor and also the total number of man-hours, by classification, actually expended for the day. The daily activities report shall include the following additional information:

- a. List of construction equipment used, when applicable.
- b. Areas in which the Work is performed, indicating the type of work and elevations, when practicable.
- c. Reference to any change(s).
- d. Remarks regarding unusual events, conditions, or circumstances.

13. Field Records: Contractor shall maintain at the job site, up-to-date copies of all drawings, specifications, and other Contract documents and supplementary data, complete with the latest revisions thereto. In addition, Contractor shall maintain a continuous record of all field changes and, at the conclusion of the Work, shall incorporate all such changes on the drawings and other engineering data and shall submit two (2) complete copies thereof, to IPSC. Throughout the Work under the Contract, IPSC shall have the right to inspect and/or audit all records related to the Work including the record of field changes.

14. Contractor's Supervision on IPP Premises: Contractor shall provide adequate management, supervisory, and technical personnel at the job site as required to ensure expeditious and competent handling of the Work. Contractor shall be responsible for complete supervision and control of all subcontractors as though they were Contractor's own personnel. Notice to Contractor shall be considered notice to any affected subcontractor.

IPSC shall have the right to require removal from IPP premises, any of Contractor's or subcontractor's employees if, in the judgment of IPSC, such removal is necessary to protect IPSC's interests.

Contractor's supervisory personnel shall coordinate Contractor's and subcontractor's programs for safety and accident prevention, fire protection, security and property protection with like programs developed by IPSC. All of Contractor's supervisory personnel shall be required to attend an IPSC safety orientation meeting before performing any work on site, and again, at least once each year.

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Contractor shall be responsible for orientation, training, monitoring, enforcement, and all other aspects of implementation and coordination of safety policies and procedures. Contractor shall provide signed documentation within one (1) week of arriving on IPP premises or within one (1) week of commencing each job, verifying that all Contractor's and subcontractor's employees have been fully trained in Contractor and required IPSC safety policies and procedures.

Contractor shall be capable of dispatching to the job site, an individual specializing in and specifically trained as a Safety Coordinator for the purpose of monitoring any required phase or item within Contractor's work scope and enforcement of Contractor's safety procedures, where directed by the Project Coordinator.

15. Subcontracts: It is the intent of these Specifications that Contractor shall perform the majority of the field work with Contractor's own forces and under the management of its own organization. The Work may be subcontracted only by subcontractors who have been approved in writing by the Project Coordinator. Such subcontractors shall not perform work for any other contractor on IPP premises without the specific approval from the applicable Project Coordinator. All subcontractors shall be directly responsible to Contractor and shall be under Contractor's general supervision. All work performed under subcontracts shall be subject to the same Contract provisions as the Work performed by Contractor's own personnel.
16. Relations With Other Contractors: Contractor shall cooperate with all other contractors who may be performing work in behalf of IPSC and workmen who may be employed by IPSC. Contractor shall conduct its operations to minimize interference with the Work of such contractors or workmen. Contractor shall promptly make good, at Contractor's own expense, any injury or damage that may be sustained by other contractors or employees of IPSC, at Contractor's hands. Any difference or conflict which may arise between Contractor and other contractors, or between Contractor and IPSC's employees, in regard to the Work, shall be resolved through the applicable Project Coordinator.

If any part of Contractor's Work is dependent upon the quality and completeness of work performed under another contract, Contractor shall inspect such portion of the other contractor's work and promptly report any defects therein which render such work unsuitable for the proper execution of the Work under the Contract. IPSC will promptly clarify such matters and so inform Contractor. Any Work affected by such discoveries, which is performed by Contractor prior to clarification by IPSC, shall be at Contractor's risk. Failure to report such defects to IPSC shall constitute Contractor's acceptance of such work as suitable to receive Contractor's Work, provided however, Contractor shall not be responsible for defects which develop after its inspection and which could not have been reasonably detected or foreseen.

17. Methods of Field Operation: Contractor shall inform IPSC in advance as to Contractor's plans for carrying out each part of the Work. Review by IPSC of any plan or method of Work proposed by Contractor shall not be considered as an assumption of any risk or liability by IPSC or any officer, agent, or employee thereof.

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18. Lines, Grades, and Elevations: All Work shall be done to lines, grades, and elevations indicated in the Contract Documents. Contractor shall provide suitable equipment and competent workmen who shall lay out the Work. Basic horizontal and vertical control points will be established or designated by IPSC, where required. The points shall be used as datum for Work under the Contract.

Contractor shall provide experienced instrument competent assistants and such instruments, tools, stakes, and other materials required to complete survey, layout, and measurement work. In addition, Contractor shall furnish competent men from its force, and such tools, stakes, and other materials as IPSC may require in establishing or designating control points, in establishing construction easement boundaries, or in checking survey, layout, and measurement Work performed by Contractor.

Contractor shall keep IPSC informed, with reasonable advance notice, of the times and places at which Contractor wishes to do Work, so any checking deemed necessary by IPSC may be done with minimum inconvenience to IPSC and minimum delay to Contractor.

Any Work done without being properly located may be ordered removed and replaced at Contractor's expense.

19. Preservation of Monuments and Stakes: Contractor shall carefully preserve all monuments, benchmarks, reference points, and stakes. Any such references shall be removed only with permission from IPSC. References removed without permission from IPSC shall be replaced by Contractor at its own expense.

20. Safety and Accident Prevention: Contractor shall conduct all operations under the Contract in a manner to avoid the risk of bodily harm or a risk of damage to any property. Contractor shall continuously inspect all work, materials, and equipment to discover and determine any unsafe condition and shall be solely responsible for the discovery, determination, and correction of any such condition. This requirement shall apply continuously and shall not be limited to normal working hours.

Prior to start of Work, Contractor shall visit the job site and become familiar with the risks of injury associated with the Work. Contractor shall review the Work to be performed at the job site, with IPSC's representative and shall adequately prepare for any risk of harm with regard to the Work to be performed.

Contractor further agrees that it shall at all times provide at the job site a competent supervisor(s) familiar with IPSC's and the industry's safety standards to ensure compliance with all IPSC, federal, state, and local regulations pertaining to safety, including, but not limited to, Federal and State OSHA, as said regulations relate to the Work to be performed under the Contract. Although IPSC assumes no responsibility to

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oversee or supervise the Work, IPSC reserves the right to review safety programs and practices and make recommendations to Contractor. Any such review or recommendation by IPSC shall not increase or create IPSC liability or responsibility and shall not relieve Contractor from providing a safe work environment and complying with legal requirements and Contractor's safety procedures and programs.

Prior to mobilizing to IPP premises, Contractor shall prepare and submit a complete safety plan to IPSC for review. The plan shall include a detailed description of all measures to be taken to ensure the safety of all personnel at the job site with regard to the Contract Work, including, but not limited to:

1. Emergency procedures.
2. Respirator training.
3. Right to know or hazardous communication.
4. Scaffold certification program.
5. Confined space.
6. Drug testing policy.

Review of Contractor's safety plan by IPSC does not relieve Contractor of any responsibility in fully implementing the safety plan or seeing that proper safety procedures are employed in completing the Contract Work.

IPSC may monitor Contractor's safety measures and (without assuming any duty or responsibility) may require that Contractor change or update its safety and accident prevention program, even if Contractor's existing program meets or exceeds applicable codes and regulations.

Contractor shall maintain accurate accident and injury reports and shall furnish IPSC a weekly summary of injuries and contributing circumstances.

Contractor shall provide, as part of labor overhead, all required safety equipment and enforce the use of such equipment by all of Contractor's and subcontractor's employees, including, but not limited to, all safety-related testing, training, safety monitoring equipment, and personal protective devices.

21. Security and Property Protection: Contractor shall be accountable for any damages resulting from Contractor's operations. Contractor shall be fully responsible for the protection of all persons including members of the public, employees of other

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contractors or subcontractors, employees of IPSC, and all public and private property including structures, sewers, and utilities, above and below ground.

Within three (3) days after discovering damage or being notified of any damage, loss, or injury resulting from Contractor's operations, Contractor shall make a full and complete report thereof in writing to IPSC.

Contractor shall utilize and maintain all necessary safety equipment including barriers, signs, warning lights, and guards, to provide adequate protection of persons and property.

Contractor shall give reasonable notice to the owners of public or private property and utilities when such property and utilities are liable to injury or damage through the performance of the Work. Contractor shall make all necessary arrangements with such owners relative to the removal and replacement or protection of such property or utilities.

Contractor shall be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or men to or from the Work or any part or site thereof, whether by Contractor or subcontractors. Contractor shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction over, the damaged property concerning its repair or replacement, or payment of costs incurred in connection with the damage.

Contractor shall be responsible for all materials and equipment in its custody or utilized in construction. Security methods shall be employed as required to ensure the protection of all materials, equipment, and tools from theft, vandalism, fire, and all other damage and loss.

Visitors' passes and badges shall be obtained from the appropriate IPSC Security Services representative. Contractor shall also be responsible for identifying visitors, their conduct while on the job site, and the return of the visitors' passes and badges.

For security reasons, all Contractor's employees, visitors, subcontractors, representatives, and agents shall be required to display on their hardhats: Contractor's name and employee's name.

The number of Contractor-owned vehicles allowed on site will depend upon the Work in progress and shall be as approved by IPSC. The use of the on-site parking areas for all persons and delivery vehicles entering or leaving the job site will be as designated by IPSC. Use of parking space(s) other than as designated will be subject to appropriate action by IPSC.

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IPSC will also have the unqualified right to require inspection of all hand-carried containers, and identification and inspection of all vehicles entering or leaving the IPP premises.

22. Emergency Protection: Whenever Contractor has not taken sufficient precautions for the safety of the public or the protection of the Work under the Contract or of the adjacent structures or property and whenever an emergency has arisen and immediate action is considered necessary, then IPSC, with or without notice to Contractor, may provide suitable protection by causing work to be done and material to be furnished and placed. The cost of such work and material shall be borne by Contractor and if the same is not paid on presentation of the bills therefore, such costs may be claimed against Contractor's bonds and/or deducted from any amounts due or to become due Contractor. The performance of such emergency work shall not relieve Contractor of responsibility for any damage which may occur.

In the event of any emergency, which IPSC determines endangers life or property, such work shall be performed by Contractor on oral orders from IPSC and confirmed in writing as soon as practicable. In the event of ordered emergency work, Contractor shall keep accurate records of actual costs for review by IPSC.

23. Qualifications of Workmen: Contractor shall employ only workmen who are competent to perform the Work assigned to them and, in the case of skilled labor, who are adequately trained and experienced in their respective trades and do satisfactory work.
24. Sunday, Holiday, and Night Work: No Work shall be done between 6:00 p.m. and 7:00 a.m., on Sundays or on legal holidays without the written consent of IPSC. All Work schedules for Contractor's site personnel shall be approved by the Project Coordinator.
25. Unfavorable Conditions: During periods of unfavorable weather, wet grounds, or other unsuitable conditions, Contractor shall confine operations to Work which will not be affected adversely thereby. No portion of the Work shall be completed under conditions which would affect adversely the quality thereof, unless special means or precautions acceptable to IPSC are taken by Contractor to perform the Work in a proper and satisfactory manner.
26. Fire Protection: Contractor shall comply with IPSC's procedures regarding fire protection. Supplementing these requirements, Contractor shall use only work procedures which minimize fire hazards to the extent practicable. Combustible debris and waste materials shall be collected and removed from the job site each day. Fuels, solvents, and other volatile or flammable materials shall be stored away from the Work and storage areas in well-marked, safe containers. Good housekeeping is essential to fire prevention and shall be practiced by Contractor throughout the course of the Work.

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Scaffolding, planking, and similar materials which are combustible, but which are essential to execution of the Work, shall be treated for fire resistance. Fire-retardant treated lumber shall be UL listed or Factory Mutual approved and consideration shall be given to the leachability of the treatment. Where combustible materials must be utilized within an area where ignition sources exist, Contractor shall dampen such materials or take further steps, at the commencement and conclusion of Work each morning and afternoon, to ensure that possible ignition sources are quenched or isolated.

Temporary heating facilities shall be approved by the Project Coordinator prior to use and shall not be left unattended.

Contractor shall provide adequate fire protection equipment in the temporary structures Contractor is occupying in accordance with NFPA 241 and as specified herein. Access to sources of fire water shall be identified and kept open at all times. Suitable fire extinguishers shall be provided in enclosed areas, in areas which are not accessible to fire water, or in areas which may be exposed to fire that cannot be safely extinguished with water.

Each fire extinguisher shall be of a type suitable for extinguishing fires which might occur in the area in which it is located. In areas where more than one type of fire might occur, the type of fire extinguisher required in each case shall be provided. Each extinguisher shall be placed in a convenient, clearly-identified location that would offer the greatest opportunity for accessibility in the event of fire.

Contractor alone shall be responsible for providing adequate fire protection. Failure of Contractor to comply with, or IPSC to enforce, the above requirements shall not relieve Contractor from any other responsibility or obligation under the Contract.

27. Work Area Limits: The Project Coordinator will designate the boundary limits of access roads, parking areas, storage areas, and work areas and Contractor shall not trespass in or on areas not so designated. Contractor shall be responsible for keeping all of its personnel out of areas not designated for Contractor's use; except, in the case of isolated work located within such areas, IPSC will issue permits to specific Contractor personnel to enter and do the Work.
28. Food Services: No Contractor-arranged food services will be permitted on IPP premises unless approved by the Contract Administrator.
29. Protection of Work: Contractor shall be solely responsible for the protection of its Work until official acceptance by IPSC. Contractor shall have no claim against IPSC or its employees because of any damage or loss to Contractor's Work and shall be responsible for the complete restoration of damaged Work to its original condition complying with these Specifications and as directed by IPSC.

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If a conflict or disagreement develops between Contractor and any other contractors concerning the responsibility for damage or loss to Contractor's Work, the conflict shall be resolved as provided under Article 16 of this Division, Relations With Other Contractors. Such conflict shall not be cause for delay in the restoration of the damaged Work. Contractor shall restore the Work immediately and the cost thereof will be assigned pending the resolution of the conflict.

30. Protection of Concrete and Other Finished Surfaces: Finished surfaces, including concrete, shall be protected from chipping, gouging, scratching, staining, and other damage. Damaged sections shall be repaired or removed and replaced subject to IPSC's discretion and acceptance. Heavy planks and mats shall be placed under equipment and materials being stored, moved, assembled, or installed on or above floor surfaces. Nonflammable, oil-resistant coverings shall be used to protect surfaces from staining.
31. Protection of Grating and Stair Treads: Floor gratings and stair treads shall be protected against damage from heavy loads, movement of equipment, materials, flame-cutting, welding, and other such construction activities. Where heavy equipment or material loads are to be stored or moved over gratings, such loads shall be supported directly from the structural steel and shall not be allowed to bear on the gratings. Damaged sections shall be repaired or replaced subject to IPSC's discretion and acceptance.
32. Protection of Electrical Raceway, Cable, and Lighting Fixture: Contractor shall protect electrical raceway, cable, lighting fixtures, and associated support systems against damage from movement of equipment and materials, welding, flame-cutting, and other work activities. Raceway and supporting structures for raceway and lighting fixtures shall not be used as access scaffolding at any time. Whenever welding or flame-cutting operations occur above or near raceways, cables, or lighting fixtures not shielded from such operations by concrete floors or other protective covers, Contractor shall protect the raceways, cables, and lighting fixtures from damage by means of fireproof boards or blankets.
33. Repair of Damages: Contractor shall immediately repair any damage which results from Contractor's Work activities or abnormal use, including damage done to the existing facilities. All such repair work must be acceptable to IPSC.
34. Independent Testing Laboratory: Except as otherwise specified, laboratory testing specified in the technical requirements will be done by an independent testing laboratory retained by IPSC. All costs for such laboratory services will be paid by IPSC unless otherwise specified within the applicable Scope of Work.
35. Oil Spill Prevention and Control: Contractor shall be solely responsible for its operations involving unloading, storing, handling, and using oil and oil by-products on IPP premises and shall be solely responsible for strict compliance with the requirements of the

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Environmental Protection Agency (EPA) as published in the Code of Federal Regulations (CFR) Title 40, including Articles 110 and 112.

Contractor shall unload and store oil and oil by-products at the location designated by IPSC. In the event of an oil spill, Contractor shall furnish all material, labor, and equipment required to expedite the cleanup work in compliance with IPSC's attached Oil Spill Prevention, Control, and Countermeasure Plan, PAI #101 and the requirements of Title 40 of the CFR.

36. Scaffolding: Contractor shall furnish all scaffolding, staging, ladders, flooring, runways, and any other temporary construction required for the execution of its Work. Contractor shall construct scaffold using only personnel trained and certified in the proper construction and inspection of scaffolding.

All scaffolding shall be subject to approval by IPSC and shall meet or exceed IPSC standards and OSHA design standards for safety and adequacy.

All scaffolding, runways, and other temporary construction shall be self-supporting throughout and shall be rigidly built so as to support safely the weight of all materials, apparatus, equipment, and personnel to be placed thereon as required by federal, state, and local laws.

37. Inspection of Field Work: All material delivered and Work performed shall be subject to inspection by IPSC. Such inspection shall not relieve Contractor of the responsibility of furnishing high-quality labor and materials in strict accordance with the Contract Documents. Any materials or field Work accepted and later found to be defective shall be replaced without cost to IPSC. Contractor shall perform its own thorough inspection and after it is satisfied it has met all requirements of the Contract Documents, shall request IPSC's acceptance.

Contractor shall keep IPSC informed of the progress of the Work and shall allow IPSC not less than two (2) days notice in advance of appropriate times for inspections and tests unless specifically arranged otherwise, in advance, with IPSC. Contractor shall furnish IPSC reasonable facilities, samples, and proper authority for access for inspection and tests and for obtaining such information as IPSC may require.

When specific inspections are required hereunder, Contractor shall not proceed beyond that point until IPSC has made the inspection and given approval. No such inspection shall be waived except by written permission from IPSC.

38. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless approved by the Contract Administrator.

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39. Temporary Facilities: Contract shall provide field offices and temporary facilities as necessary for completion of the Work and according to the following provisions:
- a. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
 - b. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations. (***Store combustible materials apart from building***).
 - c. HVAC Equipment: Provide vented, self-contained, electric, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - (1) Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - (2) Heating Units: Listed and labeled for type of fuel being consumed by a testing agency acceptable to authorities having jurisdiction and marked for intended use.
 - d. Locate facilities where directed by the Contract Administrator.
 - e. Termination and Removal: Remove each temporary facility when need for its service has ended. At end of construction, clean and restore any areas used for temporary facilities.
40. Temporary Utilities: Contractor shall be responsible for connections to Owner's temporary utilities.
- a. Sewers and Drainage: No sewage service is available.
 - b. Water Service: Use of Owner's existing water service facilities will be permitted as long as facilities are cleaned and maintained in a condition acceptable to Owner. At substantial completion, Contractor shall restore these facilities to condition existing before initial use.

Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
 - c. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities. Use of IPSC's existing toilet facilities will not be permitted.

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- d. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - e. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - f. Electric Power Service: Use of Owner's existing electric power service will be permitted as long as equipment is maintained in a condition acceptable to Owner.
 - g. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

- h. Telephone Service: IPSC will provide access to telephone service. Contractor shall be responsible for all third-party charges associated with that service.

- (1) At each telephone, Contractor shall post a list of important telephone numbers:

- (a) Control Operator Number - 6100
- (b) Control Operator Emergency Number - 2-911
- (c) Contractor's Home Office Number

- (2) Provide Superintendent with cellular telephone or portable two-way radio for use when absent from field office.

- 41. Trash Removal: IPSC will provide a receptacle for solid, nonhazardous trash generated by Contractor's activities. The receptacle will be emptied once per week or more frequently if arranged with the Contract Administrator.
- 42. Snow Removal: IPSC will provide snow removal on the job site roads and parking lots. Contractor shall provide snow removal as needed around Contractor's Work areas.

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43. Emergency Service: IPSC will maintain a first-aid office for use by Contractor during normal work hours, Monday - Friday, 7:00 a.m. to 4:30 p.m. In the event emergency services are required, Contractor shall immediately notify the Control Operator at 2-911 and the Control Operator will notify local agencies as required. All emergency situations shall be coordinated with the Control Operator on site 24 hours/day.
44. Explosives: Explosives, including explosive-actuated tools, shall be used only with approval of the assigned Project Coordinator.
45. Hazardous Materials: All hazardous materials under the Contract shall be handled in accordance with IPSC's attached administrative directive PAI #106 and PAI #144, and current U.S. Department of Transportation regulations.

Hazardous materials purchased by Contractor for use at IGS, as a consequence of working for IPSC, shall require approval by the Project Coordinator. Contractor shall submit to the Project Coordinator a detailed listing of materials to be used for the Work and the applicable MSDSs prior to the use of the materials. No hazardous material shall be used by Contractor at IGS unless it has been approved by the Project Coordinator. Contractor is responsible for removal and proper disposal of any and all hazardous wastes generated by their construction activities. Contractor shall ensure that no hazardous materials are allowed to enter or drain into any site drainage system. Similarly, Contractor must:

- a. Train all potentially exposed personnel on the MSDS and hazardous material used on the job site and in the vicinity.
- b. Provide protective equipment to potentially exposed personnel.
- c. Provide proper management, transportation, and disposal of all hazardous materials and/or wastes as specified by the Utah Bureau of Solid and Hazardous Wastes and EPA, Region VIII.

NOTE: BEFORE BRINGING HAZARDOUS MATERIALS ON SITE SEE PROJECT COORDINATOR!

PART F - DIVISION F2

DETAILED REQUIREMENTS FOR FIXED PRICE WORK

1. General: The IGS consists of two (2) coal fired generating units with each having a maximum gross capacity of 950 Megawatts. IGS is operated and maintained by IPSC. Contractor will be utilized to supply electrical construction services in support of IPSC as directed by the Contract.
2. Scope of Work: Contractor shall supply all necessary materials, supervision, labor, equipment, vehicles, supplies, services, tools, or other similar items as required for completion of the Work as outlined in the individual Job Packages.
3. Technical Requirements: The attached IPP 9255 Construction Modification Services 71.0603 shall be used to direct the technical aspects of the Work unless directed otherwise in writing by the Contract Administrator.
4. Schedule: The schedule for each Project shall be as directed by the Contract Administrator.

PART F - DIVISION F3

DETAILED REQUIREMENTS FOR TIME AND MATERIAL OR OTHER WORK

1. **General:** In addition to the Work outlined in the Work Packages, IPSC may require additional help completing various electrical Projects. Most of these Projects may need to be completed before or during the Spring Outages on both Units. Since the total scope of the additional Work is not completely defined, this Work may be completed on a Time and Material Basis or fixed price bids may be requested.
2. **Scope of Work:** Contractor shall supply all necessary materials, supervision, labor, equipment, vehicles, supplies, services, tools, or other similar items as specified by the Project Coordinator or as specified herein.
3. **Technical Requirements:** The attached IPP 9255 Construction Modification Services 71.0603 shall serve as a general guide for the Work under this Division of the Contract. The actual materials and processes used for each individual Project will be specified by the individual Project Coordinator.

SAFETY CODE

I. EMPLOYEE RESPONSIBILITY

Employees have a coresponsibility for their own safety and that of their fellow employees. Under no condition shall any employee start work until measures have been taken to reduce or eliminate hazards, and the employee has been thoroughly briefed on the hazards by the person directly in charge. They will not start work until directed to do so by the person in charge, and then only if the employee is confident that he/she understands and can do it safely.

II. CONDUCT

- A. All employees shall use only safe, approved work methods and procedures in the course of their work duties. Risks or unsafe shortcuts shall not be taken during these work activities.
- B. Practical jokes, horseplay, fighting, or other activities subjecting employees to the risk of bodily injury are prohibited.

III. AUTHORITY TO WORK ON STATION EQUIPMENT

When work is to be done on any station equipment connected to or containing energy sources, work must not be started until a written clearance or "OK TO" is in effect. All written clearances or "OK TO's" must be conducted strictly in accordance with approved Intermountain Power Facility Safety Clearance Procedures. The equipment must be appropriately tagged and verified safe in accordance with such procedures as outlined in the IPSC Clearance Procedures or the Blue Flag Rules.

IV. REPORTING ACCIDENTS AND EMERGENCIES

To report an accident or emergency situation, call the emergency phone number on site (2-911) or if not near a phone, call the Main Control Room on radio channel one. Injuries and accidents sustained at work must be reported to the employee's supervisor immediately and shall be reported to the Safety/Training Section on the same day. All injuries must be reported on the Supervisor's Accident Report. It is also required that all work-related injuries/illnesses requiring the clinic, EMT, or off-site treatment, be reported to the Main Control Room by the employee's supervisor.

V. HOUSEKEEPING

- A. Work locations, vehicles, and buildings (inside and outside) shall be kept clean and orderly at all times.

- B. Combustible materials, such as oil soaked rags, waste, and metal shavings, shall be kept in approved metal containers with metal lids. Containers shall be emptied as soon as possible.
- C. Used rags shall be stored in metal or metal lined bins with metal covers.
- D. Flammable liquids such as gasoline, benzene, naphtha, and lacquer thinner shall not be used for general cleaning purposes.
- E. All solvents shall be stored in approved, properly labeled containers.
- F. Permanent floors and platforms shall be kept free of dangerous projections or obstructions and shall be maintained reasonably free from oil, grease, water, or other substances that could cause a slippery surface. Where the type of operation produces slippery conditions, mats, grates, cleats, or other methods shall be used to reduce the hazard of slipping.
- G. Stairways, aisles, permanent roadways, walkways, and material storage areas in yards shall be kept reasonably clear and free from obstructions, depressions, and debris.
- H. Materials and supplies shall be stored in an orderly manner to prevent their falling or spreading, and to eliminate tripping and stumbling hazards.
- I. For kerosene and cleaning agents of the "mineral spirits" solvent (Safety Kleen) class, not more than one gallon of such liquids shall be kept in any open container. The container shall be properly labeled with a proper cover and remain securely covered except when in actual use.
- J. When pouring or pumping gasoline or other flammable liquids from one container to another, metallic contact (bonding) shall be used.

VI. SMOKING

- A. Smoking or open flames are not permitted where flammable, explosive gases, or highly combustible materials are stored or used. Absence of "No Smoking" signs shall not be construed by the employee to mean that smoking is permitted.
- B. The discarding of matches, cigars, cigarettes, or other substances that are burning is prohibited. These materials must be extinguished and placed in a proper receptacle or otherwise disposed of safely.

NOTE: Smoking is not permitted inside buildings.

VII. INTOXICANTS

- A. The evidence of intoxication or use of intoxicating beverages or drugs on the job or during working hours is strictly prohibited, and shall be sufficient cause for disciplinary action to include termination. Any employee discovered under the influence of intoxicating beverages or drugs shall not be allowed on the job.
- B. Medication which is prescribed by a physician and does not impair the safe performance of job duties shall be allowed.

NOTE: Refer to Drug and Alcohol Policy, PAI #88.

VIII. FIRE PROTECTION

- A. Fire protection equipment shall be properly located at all times. Except for actual fire use, or testing and training, employees shall not move or remove such equipment without proper authority.
- B. Any malfunctioning, discharged equipment, or impairments shall be reported immediately to the Safety/Training Section so an Impairment Form can be filed.
- C. Fire extinguishers shall be wall mounted (recommended mounted height is 42 inches or less).
- D. Employees shall be familiar with both the location and the operation of all the protection equipment in the vicinity of their work area.

IX. PERSONAL PROTECTIVE EQUIPMENT

- A. Eye and Face Protection
 - 1. Approved IPSC safety glasses (Z.87), with side shields, shall be worn by all persons at all times except for those in office areas, control rooms, lunchrooms, and parking lots, unless the work being done in these areas requires the use of eye and face protection.
 - 2. Face shields shall be worn when in the proximity of high voltage switching.
 - 3. All employees who are subject to electrical contact or flash, shall wear approved plastic frames (PAI #68, Approved Eye Protection and Prescription Safety Eye Wear Procedures).

B. Head Protection

1. Approved IPSC hard hats that meet the requirements and specifications established in the ANSI Requirements for Industrial Head Protection (ANSI Z89.1.1986) shall be worn in all areas and at all times except for office areas, control rooms, lunchrooms, and parking lots unless the work being done in these areas requires the use of a hard hat.
2. Safety head gear and suspension system shall not be altered or modified in any manner (i.e., painting, cutting holes, etc.).

C. Hearing Protection

Approved hearing protection must be worn in designated areas or whenever required by supervision.

D. Foot Protection

The purpose of PAI #93, Approved Footwear and Safety Boot Procedures, is to define approved footwear, outline the procedures to be used when purchasing approved safety boots, and to identify when and by whom specified footwear shall be used.

All employees are responsible to wear appropriate footwear as defined in PAI #93 while at work. All employees qualify for the company participation safety boot purchase program and are encouraged to use it to improve their foot protection.

E. Life Jackets and Lifelines - On-Site Reservoirs and Ponds

Where danger of drowning exists, employees shall work in pairs, wearing approved personal flotation devices and be protected by a full-body harness and lanyard or by a safety net.

F. Respiratory Protection

1. Only company furnished and NIOSH approved respirators will be used.

NOTE: Users of respirators shall be clean shaven in areas where the respirator comes in contact with their face. Hair that interferes with the face mask valve is not permitted.

- a. All employees having to use a respirator shall be trained in the proper use and care of the respirator prior to usage. The certification will be good for a one year period. The training shall include:
 - (1) Selection/Fitting
 - (2) Inspection/Maintenance
 - (3) Storage
 - (4) Fit Testing (Quantitative)
- b. Prior to using a respirator, an employee must be determined to be medically fit (see PAI #117, Respirator Protection Program).
- c. Only those employees who have been trained, fit tested, and medically evaluated can wear respiratory protection equipment (see PAI #117).
- d. The use of disposable particulate respirators is permissible on a voluntary basis after complying with PAI #117 requirements. These respirators do not have to be fit tested.

2. Care of Respirator Protection Equipment

- a. Employees are responsible for cleaning their personal air purifying respirator after each use.
- b. Employees are responsible for storing their personal air purifying respirator in a clean, closable bag which will prevent the respirator from being contaminated.

G. Work Clothing (PAI #183)

- 1. Flame-resistant clothing shall be worn when employees are within reaching distance of exposed 50 volts or more. The function of the flame-resistant clothing is to reduce the extent of employee injury should an electrical arc occur.
- 2. Approved work shirts shall be worn by employees who normally work in hard hat areas to provide momentary protection from thermal burns in the event an employee inadvertently bumps or touches hot equipment.

X. OFFICE SAFETY

- A. Employees shall walk with care and use handrails when using stairways.
- B. Desk drawers and file cabinets shall be kept closed when not in use.
- C. Only one drawer of a file cabinet shall be pulled out at a time.
- D. Good housekeeping practices shall be observed. Slipping, tripping, and falling hazards shall be removed or barricaded.
- E. Material shall be stored securely on shelves; heavier objects shall be placed on lower shelves.
- F. Employees shall not use ventilating fans unless the blades are properly guarded, or unless the fans are securely placed at least seven feet above the floor.
- G. Solvents and other volatile or toxic substances shall be used only with adequate personal protection, in well-ventilated areas, and maintained in properly labeled containers.
- H. Unsafe or faulty electrical equipment and/or cords shall not be used.

XI. LABORATORY SAFETY

- A. All laboratory employees shall be adequately trained and supervised for both normal and emergency laboratory procedures.
- B. Laboratory employees shall avoid unsafe acts and conditions such as (but not limited to) the following:
 - 1. Failure to use personal protective equipment.
 - 2. Failure to warn coworkers or to secure equipment.
 - 3. Making safety devices inoperable.
 - 4. Operating equipment without proper training or authority.
 - 5. Using defective equipment, etc.

- C. Laboratory employees shall avoid unsafe conditions in the laboratories and report all unsafe conditions to their supervisor. Examples of unsafe conditions include the following:
1. Congestion in the work place.
 2. Defective tools, equipment, or supplies.
 3. Fire and explosion hazards.
 4. Inadequate support or guards.
 5. Poor illumination.
 6. Poor ventilation.
 7. Hazardous atmospheric conditions such as gases, fumes, vapors, etc.
- D. Laboratory employees shall be aware of potential energy sources in the laboratory (mechanical, electrical, chemical, thermal, etc.) and ensure that their use is under carefully controlled conditions to eliminate an accidental release of energy. Laboratory employees shall protect themselves as required with the use of suitable personal protective equipment and barricades.
- E. Laboratory employees shall be aware of hazardous materials used in the laboratories and shall follow recommended procedures for handling, storage, and use as outlined on **Material Safety Data Sheets**.

NOTE: Refer to PAI #170, Lab Chemical Hygiene Plan.

XII. WELDING SAFETY

- A. Prior to commencing any welding or cutting, a Hot Work Permit shall be obtained.
1. IPSC employees shall obtain permits from their supervisor.
 2. Contractors shall obtain permits from the IPSC Safety/Training Section.
- B. The employee performing the welding or cutting is responsible for ensuring the items on the Hot Work Permit are addressed prior to commencing work.

- C. The supervisor shall ensure that the Hot Work Permit is removed and turned into the Safety/Training Section when the job is complete.
- D. Before transporting any oxygen or acetylene bottle, the valve's protective caps must be in place.
- E. Oxygen/Acetylene welding and cutting must be performed only from bottled/cylinders secured in a cart or to a building, not standing loose.
- F. When transported, the oxygen and acetylene bottles shall be in the upright position and secured by a chain or clamp.
- G. Prior to installing pressure regulators, check the threads on bottles and regulators for wear, O-rings, dirt, and oil contamination.
- H. Careful routing of hoses and leads shall be performed so as not to create a trip hazard.
- I. All cylinders shall be stored upright and secured in a proper storage area.
- J. Proper personal safety equipment shall be used when welding (proper colored face protection, gloves, proper leather flash protection, and respirators).
- K. While welding in inhabited areas, welding flash shields (barricades) shall be erected and used.

XIII. CONFINED SPACE ENTRY PROCEDURE

Employees shall comply with PAI #195, Confined Space Entry Procedures when entering confined spaces.

- A. When a space meets the following definition, it will be treated as a Non-Permit Required Confined Space:
 - 1. The space is large enough for an employee to completely enter.
 - 2. The space is not meant for normal human occupancy.
 - 3. The space has limited access and egress.

The procedure for entry into a Non-Permit Required Confined Space is outlined in PAI #195.

B. When a space meets the following definition, it shall be treated as a Permit Required Confined Space:

1. The space meets the definition of Part A of this section.
2. The space has one or more of the following:
 - a. Contains or has the potential to contain a hazardous atmosphere.
 - b. Contains a material capable of engulfing an entrant.
 - c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or by a floor which slopes downward and tapers to a smaller cross section.
 - d. Contains any other recognizable, serious safety or health hazard.

The procedure for entry into a Permit Required Confined Space is outlined in PAI #195.

XIV. ENTERING AND WORKING IN HAZARDOUS AREAS

A. Entering High Voltage Areas

No employee shall enter parts of the station where high voltage buses and similar electrical equipment are installed, unless they are authorized to do so. Employees must report their presence to the operator or other person in charge, before entering such locations.

B. Entering Coal Bunkers or Hoppers

No employee shall enter a coal bunker or hopper to work on top of the coal without a safety line (approved full-body harness) attached to their person and tied off to a substantial stationary support. A standby person shall be required while working in the hopper, bunker, or silo.

C. Controlling Ignition Sources in Dust Areas

Before opening dust explosion-proof electrical or telephone equipment, or performing welding, cutting or grinding operations on coal handling equipment or in coal handling areas, precautions must be taken to prevent coal dust explosions.

D. Entering Coal Mills

Before opening any coal mill for cleaning or maintenance work, the mill must be properly isolated from the furnace and under clearance.

E. Closing Up Enclosed Vessels

No boiler, drum, combustion chamber, condenser shell, heater, flow line, storage tank, or other enclosed vessel **shall be closed or sealed until it has been made absolutely certain that no one is inside, and that all tools and materials have been removed.** (Refer to Operations Tagging Clearance Procedure #5 and PAI #75, Confined Space Door Closing Procedure.)

F. Valve Operating Mechanism

Employees are to stand clear of cables or tackles that are under strain. Cranks on hand-operated gates or other equipment should be operated with great care to prevent the operator from being struck by a rapidly revolving handle. Ratchets and dogs on lifting equipment must be inspected frequently and kept in a safe operating condition.

G. Electric Lighting and Equipment

When using electric lighting and equipment in areas where the employee will be grounded, such as inside boilers, turbines, etc., the supervisor must verify that such equipment is approved for use in the specific environment.

When using electric lighting and equipment in areas where explosion hazards and water exist, **employees must use equipment approved for that purpose.**

H. Pounding on Equipment

Under no condition shall any employee pound on heaters, boilers, valves, piping, or other apparatus carrying steam, hydraulic, or air pressure without supervisory authorization.

I. Cleaning Moving Machinery

When wiping or cleaning slip rings, commutators, or any moving machinery, great care must be taken that clothes or wipers do not get caught in moving parts.

XV. HOT EQUIPMENT

- A. Boiler firing equipment such as oil guns, igniters, etc., must always be considered as having the potential to cause burns.
- B. Ash handling tools and equipment must always be considered as having the potential to cause burns.

XVI. RECOGNIZED GUIDELINES FOR INSPECTION AND REJECTION OF SLINGS AND WIRE ROPE

A. Things to Inspect

- 1. Worn or broken outside wires.
- 2. Severe kinking, crushing, cutting, or unstranding.
- 3. Evidence of any heat damage from any cause.
- 4. Any hook with a crack, or found to have excess of 15 percent of normal throat opening, or more than ten degrees twist from the normal plane, shall be removed from service.
- 5. Use of job fabricated rigging hardware is expressly prohibited, unless designed, tested, and certified by an engineer competent in this field.

B. Chain Slings, Hoists, Etc.

- 1. Chain slings shall be inspected before and after each use by the employee and the Tool Room. Those found defective shall not be used by employees and shall be discarded by the Tool Room after being signed off by the Safety/Training Section.
- 2. The practice of using a bolt to splice a chain is unacceptable and shall not be done.
- 3. Take up slack slowly to ensure the proper seating of all links.
- 4. Always load the hook in the throat, not the point.

C. Slings

The following practices shall be observed:

- 1. Slings shall be inspected by the user prior to a lift.

2. Slings must have proper inspection coding before they are used (refer to PAI #180, Purchase, Inspection, and Use of Synthetic and Wire Rope Slings).
3. Slings that are damaged or defective shall not be used. When defects or damage are found, return the sling to the Tool Room.
4. Slings shall not be shortened with knots or bolts or other makeshift devices.
5. Sling legs shall not be kinked.
6. Slings shall not be loaded in excess of their rated capacities.
7. Slings used in a basket hitch shall have the loads balanced to prevent slippage.

NOTE: On loads over 12 feet, a multi-leg sling or a combination of multiple slings shall be used.

8. Slings shall be securely attached to their loads.
9. Slings shall be padded or protected from the sharp edges of the load.
10. Suspended load shall be kept clear of all obstructions.
11. All employees shall be kept clear of loads about to be lifted, and of suspended loads.
12. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
13. Shock loading is prohibited (i.e., jerking or sudden stops of loads).
14. A sling shall not be pulled from under a load when the load is resting on the sling.
15. REMEMBER, increasing the angle between the legs of a multi-sling pick or multi-leg sling decreases the capacity of the sling.

D. Synthetic Web Slings

1. Synthetic web slings shall be inspected prior to use. The following is cause for rejection or removal from service:

- a. Acid or caustic burns.
 - b. Melting, charring, or burns on any part of the sling surface.
 - c. Snags, punctures, tears, or cuts.
 - d. Broken or worn stitches.
 - e. Distortion or cracking of fittings.
 - f. Showing of the inner (colored) strands or threads.
- 2. Each synthetic web sling shall be marked to show its rated capacity, and shall not be used in excess thereof.
 - 3. Synthetic web slings shall not be stored close to or used in association with cement, lime, strong acids, or strong alkalis. Synthetic web slings that have been exposed to these materials shall be removed from service.

XVII. USE OF CRANES, DERRICKS, AND HOISTING EQUIPMENT

- A. Only authorized employees shall be permitted in the cab or on the equipment. Only those designated employees who are trained and authorized shall operate the hoisting equipment.
 - 1. No employee shall be permitted, unless using a device specifically designed for this purpose, to ride the hook, sling, or load of any hoisting equipment.
 - 2. Operators shall be knowledgeable of the equipment manufacturer's operator's manual and shall comply with the manufacturer's recommendations regarding operation, and at no time shall the manufacturer's recommended rated capacities be exceeded.
 - 3. Operators shall perform manufacturer recommended preoperational checks. Operators shall follow manufacturer procedures for maintenance.
 - 4. For the first lift of each day, the load shall be test lifted and the brakes checked (load lifted several inches and then tested).
 - 5. Before start-up and movement, the operator shall be certain the area is clear. The operator shall also note all physical obstructions,

electrical lines and buses, and plan necessary allowances during operation.

6. With every load, the slings and bindings shall be checked and shall be readjusted as necessary to ensure safety and stability.
7. Only one (1) person (designated) shall give lift instructions to the operator. An emergency stop signal may be given by anyone.

NOTE: *Refer to illustration.*

XVIII. TOOL SAFETY GUIDELINES

A. General

1. Condition of Tools

Employees shall keep their own tools and the tools they work with in good condition. Worn, broken, or faulty tools are dangerous and **must not be used**. Faulty tools must be repaired or returned to the warehouse for replacement.

2. Use of Tools

Tools shall be used only for purposes for which they are designed. For example, wrenches shall not be used as hammers, nor screwdrivers as chisels or pry bars.

3. Passing Tools

All tools/materials must be passed to an employee working aloft by means of tool bags or hand lines. Employees should not throw or drop material to the ground.

4. Carrying Tools

Tools or other objects must be placed in proper receptacles. Sharp tools must be properly guarded.

5. Leaving Tools

Tools or materials must not be laid on I-beams, grating, ladders, or in other places or positions from which they may fall.

6. Steel Rulers and Hammers

The use of metallic pocket rulers and hammers with metal handles around non-insulated wires or connectors that are energized is prohibited.

B. Power Tools

1. Electrical power tools shall be inspected prior to and after use.

- a. Any tool with frayed cords, cracked cases, missing or bent plug prongs, or obviously damaged, shall not be used by employees.
 - b. Must have proper ground coding on electrical cords.
 2. Pneumatic power tools shall be inspected prior to and after each use.
 - a. Any tool with frayed lines, cracked or bent connections, cracked cases, or obvious damage shall not be issued.
 3. Guards and other safety devices shall not be removed or disabled.
 4. Electric extension cords and air lines often create a trip hazard. These lines must be routed overhead, or to one side to prevent this hazard.
 5. Special care should be exercised to protect extension cords and air lines from welding flames, sparks, or other hot items.
 6. All electric tools shall have a grounding capability by the use of a ground prong or be double insulated.
 - a. If used in a moist atmosphere or in standing water, a ground fault interrupter shall be used.
 7. All extension cords shall have a ground prong (3 wires).
 8. Air lines shall be pinned or installed in such a manner as to prevent accidental loosening or whipping, should the fitting come loose.
 9. Gloves, ties, loose clothing, and jewelry shall not be worn by personnel using rotary tools, such as drills.
 10. An approved respirator shall be used when buffing, sanding, etc.
 11. Adequate vision protection shall be worn when drilling, grinding, etc.
 12. Electrical cord ends shall not come in contact with water at any time.
- C. Powder Actuated Tools (Loaded Cartridge)
1. Only those employees who have been trained in their use shall operate powder actuated tools.

2. Personnel using these tools shall be safeguarded by eye protection devices (safety eye goggles and/or face shields) and a hard hat.
3. Tools shall be maintained in good condition and serviced regularly by qualified persons. The material upon which these tools are to be used shall be examined before work is started to determine its suitability and to eliminate the possibility of hazard to personnel.
4. Before using powder actuated tools, the operator shall ensure that the protective shield is properly attached to the tool.
5. Before using powder actuated tools, the operator shall inspect the tool to ensure that it is clean, which moving parts operate freely, and that the barrel is free from obstructions.
6. A defective tool shall be tagged and immediately removed from service.
7. Powder actuated tools shall not be used in an explosive or flammable atmosphere.
8. Powder actuated tools shall not be loaded until just before the intended firing.
9. Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.

Cartridges shall never be left unattended when not in storage.

10. In case of a misfire, the operator shall hold the tool in place for 30 seconds. He shall then try to operate the tool a second time and if unsuccessful, shall wait another 30 seconds. Misfired cartridges shall be disposed of properly by placing them in a metal container and returning them to the supervisor.

D. Fuel Powered Tools

1. Fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with fire prevention section instructions.
2. Fuel powered tools shall not be used in enclosed spaces, or in areas where there is hazard for explosion due to the presence of flammable vapors, gases, or dusts.

3. Flammable liquids must be handled, transported, and stored only in UL approved, or equivalent containers. Metal-to-metal contact shall be maintained while pouring gasoline from one container to another.
- E. Scaffolding and Ladders (refer to PAI #197, Construction and Use of Scaffolding for Employee Protection and Equipment Maintenance).
1. All scaffolds must be tagged with instructions prior to anyone accessing them.
 2. All scaffolding and ladders shall be anchored or tied off to prevent slippage or movement.
 3. Top rails (45" high), midrails (installed between top rail and platform), and toe boards (at least 3 ½" high) shall be used on scaffolding. Exceptions to this need to be discussed with those inspecting the scaffold.
 4. Scaffolding shall be constructed so as to support four times the intended load.
 5. Scaffolding and ladders shall not be moved or altered while in use.
 6. Protection from overhead hazards shall be provided.
 7. Snow and ice shall be removed from scaffolding and ladders prior to use.
 8. All scaffolding shall be constructed in accordance with the applicable safety regulations.
 9. Casters or wheels shall be locked or blocked to prevent movement.
 10. Only one person at a time shall use a ladder.
 11. Employees shall face the ladder while ascending and descending the ladder.
 12. All rungs shall be kept free of grease and oil.
 13. Employees shall keep both hands on the ladder while ascending and descending. Tools shall be lifted with a tag line.
 14. Extension ladders are to be extended 36" beyond the step-off point. The top three rungs of the ladder are not to be used as steps.

15. Ladders are not to be used in a horizontal position, such as for scaffolding platforms, etc.
16. When it is necessary to use a ladder in front of a doorway, the doorway shall be guarded or barricaded.
17. Ladders shall not be placed on boxes or blocks to gain height.
18. Ladders found defective shall not be issued by the Tool Room.
19. While using a platform ladder, never stand above the platform level. The top rung shall not be used as a step.
20. When using step ladders, do not climb or stand above the second step from the top.

F. Proper Handling Procedures for Grinding Wheels

1. Handle wheels in a careful manner and store in a rack or cradle. (New grinding wheels may be stored in the original packing material.)
2. Visually inspect all wheels before mounting, for possible damage.
3. Check maximum operating speed established for wheel against machine speed.
4. Check mounting flanges for equal and correct diameter (should be at least 1/3 diameter of the wheel and relieved around the hole).
5. Use the mounting blotters that are supplied with the wheels.
6. Make sure the work rest and wheel guard are properly adjusted to no more than 1/8" away from the wheel.
7. Always use a guard that covers at least one-half of the grinding wheel.
8. Allow all mounted wheels to run at operating speed with guard in place, for at least one minute before grinding. Stand to the side of the wheel and not in line with it.
9. Always use approved eye protection and a face shield when grinding.
10. Turn off coolant before stopping wheel to avoid creating an out-of-balance condition. Allow the wheel to run at least one minute after coolant is turned off.

G. Fall Protection - Employees shall comply with PAI #111, IPSC Fall Prevention/Protection Plan, when working at any elevation more than four feet above the ground or the floor level.

1. IPSC requires all employees to use a full-body harness whenever fall protection is required.
2. Employees who perform work that requires climbing during the course of the work, shall wear their full-body harness and lanyard, of approved design at all times. Full-body harnesses, safety belts, and lanyards can be checked out of the Tool Room.
3. Individual employees are responsible for inspection of their personal protective equipment before every use.
4. In considering the most desirable anchorage for tie off, any sharp object that the lanyard may contact while at the work location or during a possible fall, must be avoided. **Lanyards must never be tied off to shafts or other parts of machinery which are subject to movement or rotation.**
5. Employees working on swinging or suspended scaffolds, or from bosun chairs or swings supported by tackles, at any elevation **over four feet** above the ground or floor level, shall in all cases wear full-body harnesses of approved design and tie off to a firm anchorage (exclusive of the scaffold or swing) or an independent safety drop line. Employees working on hydraulic or mechanical lifting devices must tie off to the equipment handrail.
6. Employees working in bins, lift baskets, or hopper cars shall wear full-body harnesses of approved design, with lanyard attached and adjusted to allow only a minimum drop in case of a fall. (Employees shall tie off to hydraulic lift equipment handrails.)

XIX. ELECTRICAL SAFETY GUIDELINES

A. General

1. Only trained and authorized personnel shall perform switching or maintenance on electrical equipment, circuits, or components.
2. A minimum of two qualified people shall be required to perform maintenance on energized electrical equipment circuits, or components of 600 volts or over.

3. Usually these circuits will be de-energized and a clearance obtained before work/testing begins. The qualified person will verify that the electrical energy has been removed by using an approved voltage tester.
4. If working on or near energized circuits of voltages 260 to 500 VAC and 250 VDC, you must wear low-voltage rubber gloves with leather protectors. On energized equipment with voltages above 500 VAC, you must wear high-voltage rubber gloves with leather protectors, and a full-face shield. At no time will the voltage rating of the gloves be exceeded.
5. Insulating gloves, hot sticks, and personal grounds must be periodically inspected and tested to verify electrical integrity. A visual inspection is required before each use.
6. Unless maintenance is being performed thereon, the covers shall remain on lighting panels, switch boxes, breaker panels, and other electrical boxes.
7. The area providing access to and from the area for three feet in front of lighting panels, breaker panels, etc., shall be kept clear.

B. Energized Conductors

Only qualified and authorized employees may work on energized conductors and apparatus, and only after obtaining an appropriate work card.

C. Speaking to Employees Working on Energized "Live Wires"

No employee shall speak to or come in contact with anyone working on energized wires, cables, switches, or other apparatus of any voltage, unless the person spoken to is aware of their presence and the discussion pertains to the work being performed.

D. Handling Capacitors

After a capacitor has been removed from service, no work shall be performed on said capacitors for a minimum of five minutes after de-energization. Both sides of the capacitors or capacitor banks must be properly shorted and/or grounded.

E. Replacing Fuses

Whenever working on secondaries or instrument transformers, it must be assumed that they may be defective and that the primary and secondary may be crossed up. In replacing blown fuses on potential transformers, the fuses must be handled with the proper tongs provided for that purpose. Sufficient clearance must be allowed so that a flashover caused by replacing a fuse on a defective circuit will not cause any injury.

F. Testing for Grounds and Shorts

When testing for grounds and short circuits, suitable testing devices must be used. Under no circumstances shall screwdrivers, pliers, or slugs be inserted into sockets or fuse blocks for the purpose of testing or burning off a ground or a short circuit.

G. Paralleling Circuits

Two circuits shall be connected only after they have been properly checked for phase rotation and designation, using equipment designed for the voltage to be tested.

H. Grounding

Installed conductors and apparatus shall be considered as energized circuits until visual cutouts or switches have been opened and proper clearance obtained. The conductors must be tested, de-energized, and then must be grounded or shorted. Distribution cutouts must be tagged out. All temporary grounding and short circuiting must be done with approved equipment (refer to Operating Order 2, Part IX).

Grounds may not be projected through a piece of equipment or apparatus. Portable grounds must be applied on each side of the worker at the structure where work is being performed, or in a location visible to the worker.

When working on underground conductors, apparatus, or buses in any type of distribution vault or manhole, they must be de-energized and grounded.

In the event that physical conditions prohibit the grounding of electrical apparatus, the employee's supervisor will prescribe in each instance proper alternative procedures. The Safety/Training Section will be available to assist with recommendations.

Special care must be taken to install grounds for protection against static charge or induced current.

Static bonding and grounding conductors shall not be disconnected. If disconnected while performing work, they shall be temporarily jumped and reconnected upon completion of work. If broken or disconnected bonding connectors are observed, the condition shall be corrected and reported to the supervisor.

I. Switching

Manually gang-operated air break switches must be locked either in the open position or the closed position.

No switching shall be done except by authority of the organization having jurisdiction over the electrical equipment. Switching must be done in accordance with approved Intermountain Power Facility Switching Procedures.

Smocks and face shields shall be worn when doing exposed switching.

J. Circuit Breakers

NOTE: Refer to Operating Orders 2 and 5 for more information.

Always Test to Determine that Circuit Breakers are Open. Sections of circuits isolated only by circuit breakers must be carefully tested before working on or grounding the circuits.

Disconnects on Circuit Breakers. Before opening or closing any circuit breaker disconnecting switch, in any circuit, a visual check shall be made to make sure that the circuit breakers in that circuit are open.

Moving Switch Mechanism. When working around circuit breakers or switch mechanisms, keep clear of the moving parts. They may operate without warning.

When overhauling circuit breakers, the pneumatic, hydraulic, electrical, and mechanical means of actuating the operating mechanism must be made inoperative by blocking or disabling.

XX. RAILCAR SAFETY GUIDELINES

A. Working Around Tracks (AAR Blue Flag Rules)

When working around the tracks and working trains, crossing the track, or being in or around the train, safety rules, when applicable, will be followed. Some of these rules are listed below:

1. Crossing or stepping afoul of tracks closely in front of moving equipment and crossing live tracks close to the end of the equipment is prohibited.
2. Before going between standing locomotives and cars, employees must wait until the slack is adjusted and have proper understanding with other employees to guard against an unexpected move, and know there is no danger from approaching cars or locomotives.
3. Giving signals to move a locomotive or car while an employee is between cars, or a locomotive and cars, is prohibited.
4. Stepping in front of moving locomotives or cars to adjust coupler or knuckle, or using foot or hand to adjust them from any position when they are about to come together, is prohibited.
5. When stepping from between locomotives and cars, watch for equipment in motion on the adjacent track or roadway.
6. Stepping from one car to another after cut has been made between them, is prohibited.
7. After giving a signal to stop stepping on track between and in front of locomotive or cars before such stop is made is prohibited.
8. Do not sit on steps of locomotives. Do not sit underneath or near standing equipment, except in the performance of duty, and only then when proper safeguards are provided.
9. Do not climb over or under couplers, or underneath standing cars or trains, except in the necessary performance of duty, and only when proper safeguards are provided. When necessary to climb through standing coupled cars, do not step on uncoupling lever or place hands, feet, or other parts of body on sliding sill or between coupler horn and end sill of car. Climbing over couplers on moving cars or underneath moving cars is prohibited.
10. Footboards of engines, steps of engines, cars or structures, transfer plates, skids, and other equipment must be kept free of snow, ice, and other slipping hazards. If necessary, salt, sand, cinders, ashes, or sawdust must be used to prevent slipping.
11. Employees whose duties require them to work around main tracks, running tracks in yards or sidings, at coal chutes, cinder pits, and similar places must at all times be on the alert for moving locomotives,

cars, or trains, and must not dress in a manner that will interfere with vision, hearing, or the free use of hands and feet.

B. Working on Railcars

When working on the railcars and moving a set of wheels or a railcar truck, the following safety rules and any others that apply shall be followed:

1. Before uncoupling air hose by hand, have both angle cocks closed and firm hold on both hoses.
2. Before reducing brake pipe pressure or dump door air line with angle cock, hold the lower end of the hose firmly.
3. Except in an emergency, turning angle cock on moving equipment without the use of a special device for the purpose is prohibited.
4. While releasing hand brakes equipped with release, controlled by lever or other such device, keep all parts of body clear of movable parts of brake.
5. Using any part of an adjacent car for foot rest when applying or releasing brake is prohibited.
6. When necessary to control cars by hand brakes, test must be made to know that such brakes are in an operative condition before cars are cut off. Employees must know how to operate the type of brake they are to use.
7. Use caution when opening or closing doors on engines, cars, or other equipment.
8. When moving car by hand, have handle of car mover slightly out of line with rail to avoid catching fingers.
9. Walking in front of wheel sets when rolling them is prohibited.
10. Wheel sets and trucks must always be pushed, never pulled.
11. Before jacking up the end of the car or a locomotive with portable air jacks, the wheels on the other end of such equipment must be carefully blocked to prevent same from moving.
12. Jacks must be in proper working order prior to use. Jacks must not be used metal-to-metal, a piece of wood or approved cushioning

material must be placed between the head of jacks and the metal to prevent slipping. Good blocking must be used under the jack and must be carefully placed and level to avoid tipping from under the load. Be sure that the jack is of sufficient capacity for the work to be done. Fold down handles when jacks are not being operated. Keep out of path traveled by jack handle.

13. Under no circumstances may jacks be left standing under load in engine houses, shops, or on repair tracks without support of trestles, horses, or blocks. When necessary to remove or replace trucks under cars, employees must not go under car to hold up center pin by hand while truck is rolled or centered, but must use tongs or slide plate for supporting pin.
14. When working in groups, employees must have an understanding of all moves to be made. Before moving heavy or bulky tools or material, all persons so engaged must have proper understanding of how the work is to be done, act in unison, and avoid awkward or twisted positions. They must have a firm handhold and footing, and as far as practicable, all parts of the body must be kept in the clear. Suitable equipment must be used to lift or move large or heavy objects.

C. Working With Switches

When operating or working on switches or working on the yard track, the following safety rules and any others that apply shall be followed:

1. Before operating switches, warn employees who are repairing or cleaning them, and make certain employees are in a safe position.
2. Keep all parts of the body clear of switch lever travel to avoid being struck. Keep hands and feet in positions where they will not be caught by lever or ball.
3. Keep body in position where it will not be struck or caught between moving locomotives and cars and switch lever or stand.
4. Be sure of secure footing before exerting stress on a switch stand lever. To avoid injury, brace body firmly, avoid twisting body, and exert a steady pull on lever.
5. When the position of a switch is to be changed behind moving equipment, employees must not attempt to operate the switch until entire movement is clear of the switch.

6. Nails and track spikes must be well started before striking a full blow.
7. Switches must not be handled by unauthorized persons. All employees must be on the lookout for derails on all sidings or other tracks.

D. Working With Moving Equipment

When getting on or off moving equipment or riding on moving equipment, the following safety rules and any others that apply will be followed:

1. Getting on or off moving equipment, except when necessary in the proper performance of duty, is prohibited.
2. When alighting from moving equipment, face direction of movement and get off with trailing foot first. Use care to ensure good footing and avoid stepping on uneven surfaces.
3. Getting on or off equipment at the instant it couples to other equipment is prohibited.
4. When about to board or alight from moving or standing cars or locomotives, look out for trains approaching on adjacent tracks, vehicles, or roadway, and that there are no obstructions or openings on the ground and no side obstructions which might cause injury.
5. Have secure hand hold when getting on or off moving locomotives or cars.
6. When getting off standing locomotives or cars, retain hand hold until foot is firmly placed on the ground or other support.
7. Do not carry lunch boxes, tools, grips, or other articles in a manner that will interfere with free and safe movement when boarding or alighting from cars, locomotives, or cabooses.
8. When getting on a leading car or one in a cut of cars, do so from the leading end, then if you miss footing or hand grasp, you will fall against side instead of in-between cars. When you are to ride the last car, the safe course is to get on or off at rear of car or caboose.
9. When going up or down ladders on cars, employees must keep foot turned slightly sideways and place portion of ball of foot firmly on each ladder rung. Keep body as close to ladder as possible, face direction in which equipment is moving, and retain firm hand hold at all times.

10. Jumping off end sills or swinging up or down between two cars and other equipment with a hand on each one is prohibited while in motion.
11. Employees must face the equipment when descending ladders on cars or steps on locomotives, and must observe if footway is clear.
12. When riding in or on moving equipment, be on guard against possible injury from sudden stop or movement.
13. Except when necessary in the performance of duty, employees must not ride on catwalks, ladders, steps, or tops of moving locomotives.
14. Riding on the side of equipment past close clearance is prohibited.
15. When riding on locomotives or cars, sit or stand in a safe position and do not permit legs or arms to protrude over sides or ends.
16. When riding moving equipment, employees should not move about unnecessarily and should protect themselves against sudden movement.
17. When cars are moved by any form of power, an employee must precede movement to keep others from fouling track upon which movement is being made.

E. Moving Trains or Cars

When moving the locomotive, the train, or a cut of railcars, the following safety rules and any others that apply will be followed:

1. The movement of locomotives in the yard and around the shop with less than two people is prohibited. One person must be in a position to protect the direction of movement at all times.
2. Suitable warning must be given before locomotives are moved.
3. Whenever the locomotive is left unattended, with or without the diesel engine running, it must have the generator field switch open, throttle placed in IDLE position, and reverser level in neutral position and removed from control stand where possible. The engine must be secured against unintentional movement.
4. Cars left standing on yard or shop tracks must have sufficient hand brakes set, or wheels chocked, to prevent movement.

5. Team work is essential to safety. When working in groups, all concerned must have an understanding of all moves to be made.

F. Working on Locomotives

When working on locomotives, the following safety rules and any others that apply will be followed:

1. Appliances used in taking supplies of fuel, water, or sand must not be moved until locomotive is properly placed and brakes applied. After the locomotive servicing is completed, appliances must be replaced and secured in a position clear of tracks before locomotive is moved.
2. Before leaning beyond side of locomotive, look in both directions for trains, locomotive, or cars on adjacent track, and structures or obstructions alongside the tracks, and vehicles on roadway.
3. When on the steps or catwalk of a locomotive, maintain secure hand hold.
4. Diesel radiator shutters often close rapidly and with sufficient force to break fingers if caught.

Care must be used at all times to keep hands, fingers, and clothing clear of these shutters.

G. Blue Flag Rules

Blue Flag Rules shall be observed as per "CODE OF FEDERAL REGULATIONS, TITLE 49, PART 218" pertaining to all work on rail equipment with reference to protection of personnel and/or equipment, a copy of which may be obtained upon request from Intermountain Railcar, Springville, Utah - Telephone Number 801-489-3248 or IPSC Extension Number 2200.

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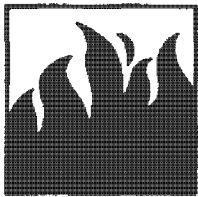
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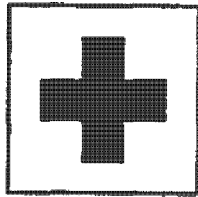
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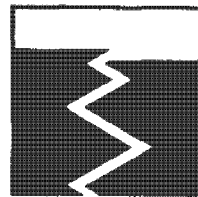
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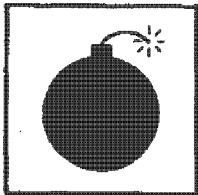
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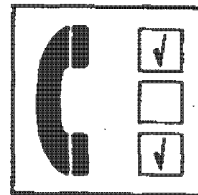
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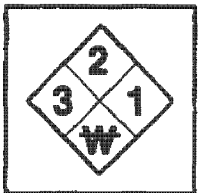
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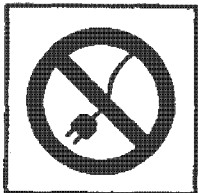
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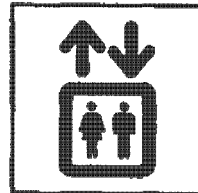
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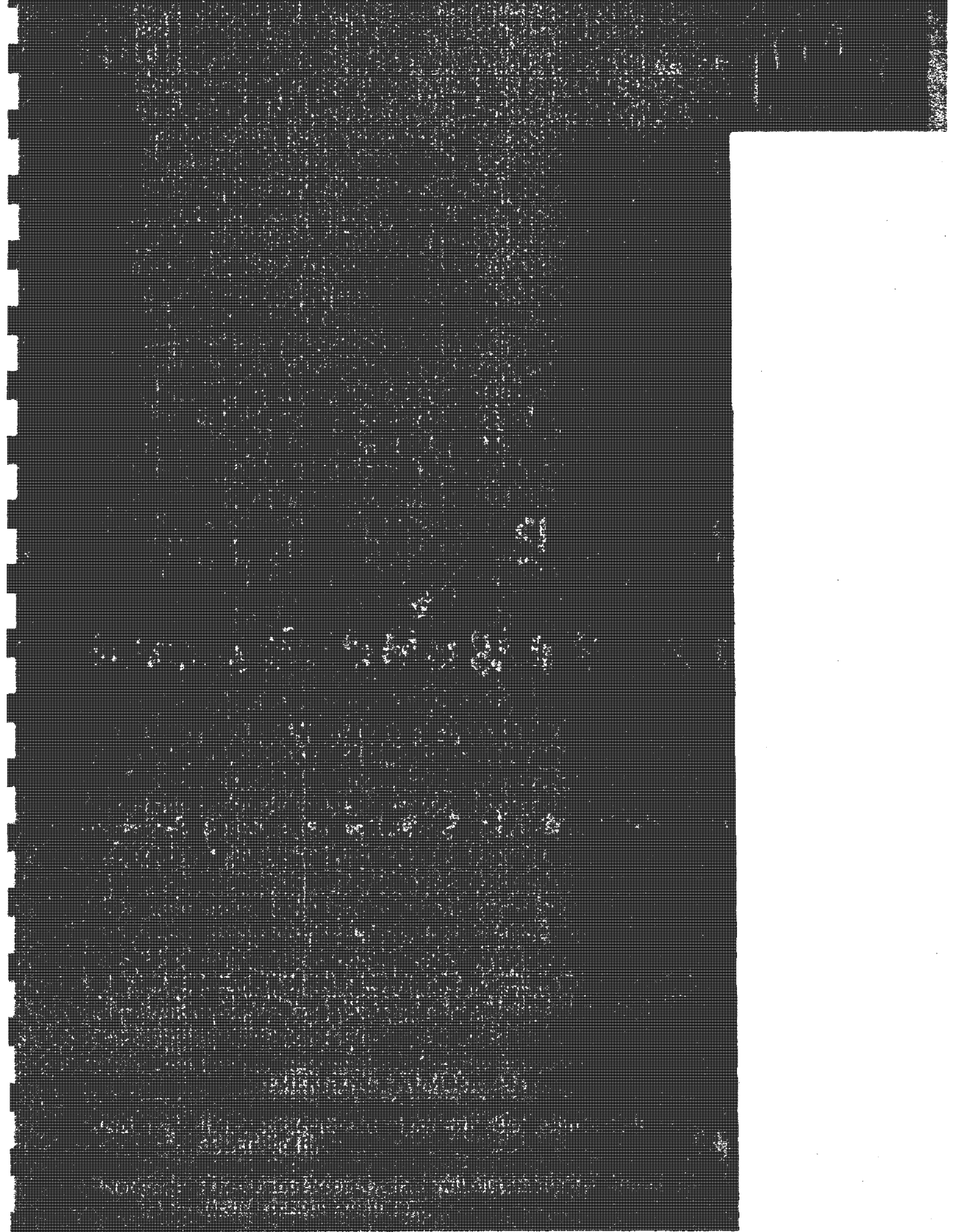
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IPSC SAFETY DEPARTMENT

Rev. 03/01

Prepared by: Michael Mooney

IP7011884



IP7011885

MEDICAL EMERGENCIES

IN THE EVENT OF A MEDICAL EMERGENCY:

1. Provide first aid if trained.
2. Call the Control Room Operator. *1

By Phone — 2-911

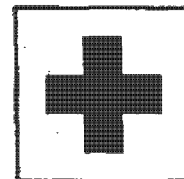
By Radio — CHANNEL 1

Give the following information:

- a. Location of victim(s).
- b. Number of victims.
- c. Type of injury or illness.
- d. Is patient breathing?
- e. Is patient conscious?
- f. Does he/she have a head injury?
- g. Is there severe bleeding?

3. DO NOT hang up until the operator does.
4. DO NOT move the victim unless life is in danger because of the environment (fire, smoke, etc.).
5. Notify your supervisor of the situation as conditions allow.

FIRST AID KITS ARE LOCATED THROUGHOUT THE PLANT SITE.
TAKE TIME TO NOTE THE LOCATION OF THE KIT IN YOUR
AREA.



2

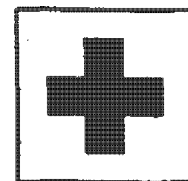
EMERGENCY NUMBER 2-911

*Note 1 — The Control Room Operator will dispatch medical personnel to the scene.

FOR CHOKING

FOR CONSCIOUS VICTIM:

1. **ASK:** Are you choking? If victim cannot breathe, cough, or speak, **CALL OUT FOR HELP!**
2. **Give the Heimlich maneuver.**
 - *Stand behind the victim.
 - *Wrap your arms around the victim's waist.
 - *Make a fist with one hand. **PLACE** your **FIST** (thumbside) against the victim's stomach in the midline **JUST ABOVE THE NAVEL AND WELL BELOW THE RIB MARGIN.**
 - *Grasp your fist with your other hand.
 - ***PRESS INTO STOMACH WITH A QUICK UPWARD THRUST.**
3. **Repeat thrust if necessary.**



2

FOR UNCONSCIOUS VICTIM:

1. **Sweep the mouth.**
2. **Attempt rescue breathing.**
3. **Give 6 ~ 10 abdominal thrusts. Repeat Steps 1, 2, and 3 as necessary.**

CAUTION: The Heimlich maneuver (abdominal thrust) may cause injury.

DO NOT practice on people!

OBESE OR PREGNANT VICTIM:

1. **Perform chest thrusts on unconscious, pregnant, or markedly obese patients while they are lying down. Chest thrusts can also be performed on a pregnant or obese patient while standing (mid-sternum hand position).**

EMERGENCY NUMBER 2-911

RADIO CHANNEL 1

RESCUE PROCEDURES

UNCONSCIOUS VICTIM:

1. Check for consciousness - tap and shout.

2. Call for HELP:

By Phone — 2-911

By Radio — CHANNEL 1

3. IF YOU ARE TRAINED IN RESCUE BREATHING:

a. OPEN the AIRWAY and CHECK for BREATHING.

*Look, listen, and feel - 3 to 5 seconds.

b. Give TWO (2) FULL, SLOW BREATHS.

*Retip head, if needed.

*Remove obstruction, if needed.

c. Check for CIRCULATION (pulse) and BREATHING.

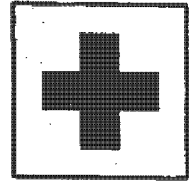
*Check carotid artery - look, listen, and feel for 5 to 10 seconds.

*Call for HELP — *Medical Emergency ~ 24 Hours.*

By Phone — 2-911

By Radio — CHANNEL 1

*Give CPR or Rescue Breathing as needed. CPR should **only** be given by a person properly trained in CPR.



EARTHQUAKE

DURING THE EARTHQUAKE:

1. Take cover underneath a desk or table. Protect your head and neck.
2. Stay away from windows and objects which could fall on you.
3. Stay where you are - DO NOT run outside. Falling debris may cause injury.
4. DO NOT use elevators.
5. If outdoors, stay in an open area. DO NOT enter the building.

AFTER THE EARTHQUAKE:

1. Remain calm.
2. Be prepared for aftershocks.
3. Stay indoors. DO NOT leave the floor unless a life-threatening condition exists, OR you are instructed to do so by a public address announcement, an Emergency Response Team member, or over the radio.
4. Notify the Control Room of injuries or medical emergencies:

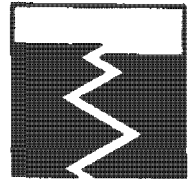
By Phone — 2-911

By Radio — CHANNEL 1

5. Assist the injured - DO NOT move them unless it is absolutely necessary. Follow the Medical procedures in Section 2.
6. If a fire occurs, follow the Fire procedures in Section 1.
7. DO NOT use telephones except to report fire or medical emergencies. Replace telephone receivers that have slipped off.
8. Notify your supervisor of the situation and your status. This should be done in person, if practical, to keep phones and radios free for emergency traffic.

REMEMBER — THE BEST WAY TO SURVIVE AN EARTHQUAKE IS TO BE PREPARED.

It is the responsibility of each building occupant to know the emergency response procedures and be familiar with the building emergency procedures, emergency exits, and evacuation routes.



EVACUATION

THINGS TO REMEMBER:

1. Remain calm - Keep all noise to a minimum.
2. Listen for instructions on the Radio - CHANNEL 1 and on the public address system.
3. **DO NOT** use elevators!
4. **DO NOT** run! Walk calmly and proceed directly to the nearest stairway/exit located away from the hazard.
5. Follow directions of Emergency Response Team personnel for any special exiting instructions.
6. Use handrails on stairways and allow room for others to enter.
7. Report immediately to your supervisor at the designated location. **DO NOT** return to the emergency scene until directed to do so by Emergency Response Team personnel.
8. Contract employees on site need to coordinate with the Contract Administrator on how they will be accounted for in the event of an emergency.

It is the responsibility of each employee to review the floor plan of his/her work area. Each employee should note the locations of the extinguishers, hose cabinets, fire-pull alarms, medical kits, emergency exits, and evacuation routes.



4

EMERGENCY NUMBER 2-911

BOMB THREAT

BOMB THREATS should be taken seriously. **DO NOT** assume that bomb threats are made only to management or security personnel. Anyone can receive a bomb threat, and everyone should be prepared.

IN THE EVENT A BOMB THREAT IS RECEIVED BY TELEPHONE:

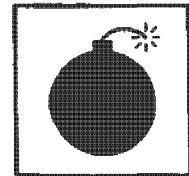
1. Remain calm - Use the bomb threat checklist on the next page to obtain information.
2. **DO NOT USE A RADIO.**
3. **DO NOT** hang up until the other person does.
4. Notify the Control Room at 2-911 when the caller hangs up.
Give the following information:
 - *Your name and type of emergency.
 - *Location of bomb (room number and/or closest column number).
 - *Time bomb is set to go off.
 - *Your location and phone extension.
5. Follow instructions given by Emergency Response Team personnel.

IF A SUSPICIOUS OBJECT IS FOUND:

1. **DO NOT TOUCH THE OBJECT.**
2. **DO NOT USE A RADIO.**
3. Notify the Control Room by telephone at 2-911.

Provide:

- *Your name and location of object (room number and/or closest column number).
 - *Description of object.
 - *Your phone extension.
 - ***DO NOT** hang up until the other person does.
4. Emergency Response Team Commanders will decide on:
 - a. Moving everyone away from the affected area.
 - b. Opening all doors in the area.
 - c. Preparing to evacuate the floor - Follow Evacuation procedures in Section 4.
 5. If evacuated, **DO NOT** return to the floor until directed to do so by Emergency Response Team personnel.



BOMB THREAT CHECKLIST

Most bomb threats are made by telephone. If you receive a bomb threat by telephone, you should attempt to obtain as much information from the caller as possible. This will assist Emergency Response Teams in determining the course of action to be taken and will assist the Sheriff's Department with their investigation.

1. Remain calm.
2. Ask the caller the following questions:

*When will the bomb go off? _____

*Where is the bomb located? _____

*What does it look like? _____

*Is it in a container? What type? _____

*What type of device is it? _____

*What is your name? _____

*How do you know about this? _____

*Why was the bomb placed? _____

NOTE: Keep the caller on the telephone and get someone to call 2-911 for you.

3. Record the following information:

*Exact time of the call. _____

*Caller's exact words. _____

*Any background noise. _____

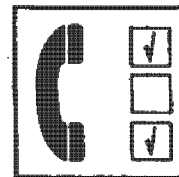
*Any accent or voice characteristics that may help identify the caller. _____

MALE ☐ FEMALE ☐ YOUNG ☐ OLD ☐

CALM ☐ NERVOUS ☐ LOUD ☐ SOFT ☐

Accent Type: _____

Other Characteristics: _____



HAZARDOUS MATERIALS INCIDENTS

IF AN INCIDENT IS DISCOVERED:

1. Move everyone away from the area of the incident.
2. Restrict the area so that no one enters into the hazard.
3. Call the Control Room Operator. *1

By Phone - 2-911

By Radio - CHANNEL 1

Give the following information:

- a. Location of the incident.
 - b. Type of hazardous material involved.
 - c. Is the incident dangerous to personnel and is anyone hurt or trapped?
4. If the incident is small and you have had proper training, attempt to contain the spill.

Do This Only If:

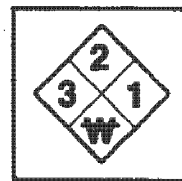
- a. The material is not hazardous i.e., cool oil or paint.
- b. It can be done safely.
- c. You have someone with you at all times.
- d. You are able to exit the area at all times.

WHEN THE AREA YOU ARE IN IS INVOLVED IN A HAZARDOUS MATERIALS INCIDENT — REACT IMMEDIATELY!

1. Proceed to the nearest stairway/exit away from the incident at either end of the building.
2. **DO NOT** use the elevator.
3. Proceed to evacuate, follow the evacuation procedures for your building.
4. Notify your supervisor of the situation and your status.

It is the responsibility of each employee to be familiar with the locations of the fire-pull alarms, fire extinguishers, hose cabinets, emergency exits, and evacuation routes.

*Note 1 — The Control Room Operator will dispatch the Fire Brigade and medical personnel to the area. The Hazardous Materials Response



POWER OUTAGES

LOCALIZED POWER OUTAGE:

In the event of a power failure in your work area:

1. Remain calm.
2. If it is safe, move to an area that is lighted. If it is unsafe, stay where you are and wait for light to be restored or help to arrive.
3. If the power failure appears to be localized to your area, notify Operations, extension 6300.
4. If there is a need for emergency help, call 2-911 or use Radio **CHANNEL 1** for assistance.
5. Follow the instructions of Emergency Response Team personnel.

TOTAL BUILDING POWER OUTAGE:

1. Remain calm.
2. **DO NOT** move about your area - wait until emergency power and lighting is restored or help arrives.
3. Follow instructions from Emergency Response Team personnel in the area or announcements made over the public address system and radios.



ELEVATOR EMERGENCIES

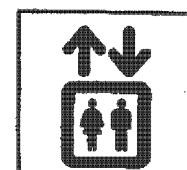
ELEVATOR EMERGENCIES: IF YOU BECOME STALLED!

1. If the elevator stops and the door does not open:
 - a. Push "Open Door" button.
 - b. If the door still does not open, push another of the floor buttons.
 - c. Repeat the above on another floor.
 - d. If car does not move and door will not open, try to open the door manually using firm pressure. **DO NOT** use tools such as pry bars, etc.
 - e. If the door still fails to open, you are stuck.
 - (1) **DO NOT** panic, your situation is not hazardous.
 - (2) Pick up the phone and the Receptionist or Control Room personnel will answer. Tell them the elevator car number or describe the elevator's location and the approximate floor level you are stuck on. Ask them to contact HVAC, extension 6841, or the Maintenance Supervisor, extension 6852, for help. It should take about 30 minutes to get you out, so sit down and relax. Pick up the phone if further assistance is needed.
 - (3) **DO NOT** try to leave the car by forcing open the top hatch on the car or entering the elevator shaft. This is extremely dangerous.
 - (4) **DO NOT** try to pry open the door.

2. Elevator Fire Alarm Mode:

If the elevator goes into the fire alarm mode because of detector malfunction or a fire is detected, the following will take place:

- a. If the car is traveling up it will proceed to the next landing and stop, then start again in the down direction. If the car is going down, it will proceed to the preprogrammed floor, usually the first.
- b. The door will not open until it reaches that preprogrammed floor that has been coded into the system. The door will then open.
- c. Get out of the elevator there and report the incident to Operations at 2-911. This may indicate that a fire is involved in the area and it should be investigated.
- d. Notify your supervisor of the situation and your status.



WORK AREA FLOOR PLAN



KEY:

First Aid Kit 

Walkway 

Extinguisher 

Exit 

Indicate escape routes by marking walkways with arrows and identify all exit doors leading to the outside. Mark all extinguisher locations along with first aid kits near your main work area.

"NOTES"

IP7011897

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Section 16B - CONTRACTOR-FURNISHED EQUIPMENT AND MATERIALS

16B.1 GENERAL. The electrical equipment and materials included in this section shall be furnished and installed by the Contractor. The equipment and materials are in addition to those specified elsewhere and are necessary to make a complete operational installation as intended by the drawings and these specifications.

All necessary grout, supports, and miscellaneous material required for a complete installation of the equipment shall be furnished and installed by the Contractor.

Additional Contractor-furnished materials for the raceway, conductor, grounding, lighting, and freeze protection systems are specified in Sections 16D through 16H.

These specifications covering Contractor-furnished equipment and materials describe the type, functions, and general arrangements desired. The scope of these specifications does not necessarily cover all design details and features.

16B.2 ENGINEERING DATA. The Contractor shall submit data to the Site Construction Manager covering all equipment and fabricated materials to be furnished under these specifications.

16B.3 CORRECTION OF ERRORS. Equipment and materials shall be complete in all respects within the limits herein outlined. All errors or omissions required to be corrected in the field shall be done at the Contractor's expense.

16B.4 CONTROL POWER. Electrical power for control and instrumentation will be a nominal 120 volt, single-phase, 60 hertz, alternating current, or a nominal 125 volt direct current. The Contractor shall provide any devices required for proper operation and protection of the equipment during electrical power supply and ambient temperature fluctuations described in the following paragraphs.

All dc electrical control devices shall be designed for continuous operation on an ungrounded station battery at any voltage from 100 to 140 volts dc. Electrical devices served from this supply shall not impose any ground connections on it. Direct current electrical control device operation shall not be affected by an undervoltage transient of 1/2 second duration at 50 volts dc.

All ac electrical control devices shall, unless otherwise specified, be designed for continuous operation at any voltage from 102 to 132 volts alternating current. The drop-out voltage shall be less than 75 volts for relays and 90 volts for contactors and starters. Alternating current

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electrical control devices operating at nominal voltages, other than 120 volts, shall be designed for continuous operation over proportional voltage variations. Alternating current electrical control device operation shall not be affected by a complete loss of voltage for 3 cycles.

All devices shall be guaranteed to operate satisfactorily under voltage conditions specified in the above paragraphs and at a range of ambient temperatures from 50 C to -10 C for indoor equipment and 50 C to -30 C for outdoor equipment.

16B.5 CLASSIFICATION IDENTIFICATION OF ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS. All electrical equipment and devices located in areas subject to conditions classified in the National Electrical Code or the National Electrical Safety Code as hazardous shall be furnished with a nameplate stating the equipment classification. The nameplate data shall include the NEC class, group, division, and operating temperature designations as applicable, and the NEMA type. Classification identification nameplates and attachment pins shall be corrosion resistant metal.

16B.6 FUSE BLOCKS. Where fuse blocks rated 30 amperes, 250 volts are required, they shall be modular type with bakelite frame and reinforced retaining clips. Blocks shall be Class H, 2 pole, Model No. H25030-2SR screw terminal fuse blocks as manufactured by Underwriters Safety Device Co., 7300 West Wilson Avenue, Chicago, Illinois 60656 or acceptable equal. Blocks for other current and voltage ratings shall be similar in construction and by the same manufacturer.

16B.7 FUSES. Where slow blow fuses are required for protection of equipment they shall be Bussmann Type MDL, or acceptable equal, with ampere ratings of 1/4, 1/2, 1, or 2. Where fast acting fuses are required for protection of equipment they shall be Bussmann Type NON, or acceptable equal, with ampere ratings of 1, 3, 6, 10, 15, 20, or 30. Fuses for use in outdoor located equipment shall be Bussmann Type FRN moistureproof. Wherever possible, molded case circuit breakers shall be used instead of fuses.

16B.8 ELECTRICAL ACCESSORY DEVICES. Electrical accessory devices shall be furnished in accordance with the requirements stated herein unless otherwise specified in the detailed specification sections.

16B.8.1 Control Relays. General service auxiliary relays shall be Struthers Dunn Type 219, except where the contact requirements for the relay cannot be accommodated by the Type 219 relay. In such cases, the Allen-Bradley Type 700P relay shall be used. Where current carrying requirements exceed the capacity of the general service auxiliary relays, auxiliary relays shall be General Electric Type HFA or HGA, Westinghouse Type MG-6, or acceptable equal. Agastat Type GPD control relays shall be used for dc applications where switching of inductive loads is required.

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16B.8.2 Push Buttons and Selector Switches. Push buttons and selector switches for nonhazardous areas shall be heavy-duty oiltight, Honeywell Micro Switch Type PT, Square D Class 9001 Type K, Allen-Bradley Bulletin 800T, or acceptable equal. Toggle switches shall be Honeywell Micro Switch Type TL "Pull to unlock" or acceptable equal.

Square D Class 9001 Type G or Allen-Bradley Bulletin 800H push buttons and selector switches shall be used for hazardous areas.

16B.8.3 Indicating Lights. Status indicating lights for nonhazardous areas shall be Honeywell Micro Switch Type PTW, Series 2340 for 120 volt ac or 125 volt dc service or Series 2150 for 24 volt service, with Type 387 lamps, plastic lenses, and appropriately sized resistors.

Square D Class 9001 Type G status indicating lights shall be used for hazardous areas.

16B.9 NAMEPLATES. Nameplates shall be furnished when specified in the detailed specification sections and when specified in this article. Nameplates shall be made of laminated black phenolic engraving stock with white core. The lettering shall be not less than 3/16 inch square unless otherwise indicated, bold engraved through the outside layer so that the letters are the color of the core. Nameplates shall be attached to the equipment with stainless steel panhead screws.

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Subsection 16B1 ~ SEPARATELY MOUNTED MOTOR STARTERS

16B1.1 GENERAL. This subsection covers separately mounted motor starters which shall be furnished and installed under these specifications.

Motor starters, accessories, and enclosures for mounting separate from motor control centers shall be furnished and installed in the sizes, types, and locations indicated on the drawings.

Each starter shall have a nameplate which shall be as specified in this Section 16B. Nameplate engraving shall be as directed by the Site Construction Manager.

The Contractor shall coordinate overload relay heaters with the driven equipment.

The motor starters and accessories shall be in accordance with the requirements of NEMA ICS, the applicable requirements of the Federal "Occupational Safety and Health Standards," and the articles which follow.

16B1.2 SINGLE-PHASE STARTERS. Each single-phase ac starter shall include a 120 volt, 2 pole, 60 hertz contactor with one manual reset thermal overload relay, and 120 volt ac operating coil. Single-phase starters shall be Size 0 or larger and shall be furnished in NEMA Type 12 enclosures arranged for surface mounting.

16B1.2.1 Auxiliary Contacts. Normally open and normally closed auxiliary contacts shall be furnished as indicated on the drawing included at the end of this subsection.

16B1.2.2 Overload Relays. One manually resettable thermal overload relay of the bimetallic type shall be furnished with each motor starter. The thermal overload relay heaters shall be rated as required to protect the motors from damage due to overload.

16B1.2.3 Remote Control. Each single-phase magnetic ac starter shall be equipped for control from local or remote push button, control switch, or other pilot devices. All necessary internal wiring for this feature shall be supplied and connected to terminal blocks so located as to provide easy connection to the external control wiring in accordance with the drawing included at the end of this subsection.

16B1.3 MAGNETIC DC STARTERS. Magnetic dc starters shall be heavy-duty type mounted in gasketed enclosures.

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Starters shall have 125 volt or 250 volt operating coils as indicated in the Electrical Equipment List. Starters shall be complete with contactors, four electrically separate auxiliary relay contacts in addition to those required for starter operation (two normally open and two normally closed), terminal blocks, and two overload relays. All auxiliary and overload contacts shall be wired to terminal blocks for external connection. The terminal blocks shall also be used for all other terminations of internal and external wiring.

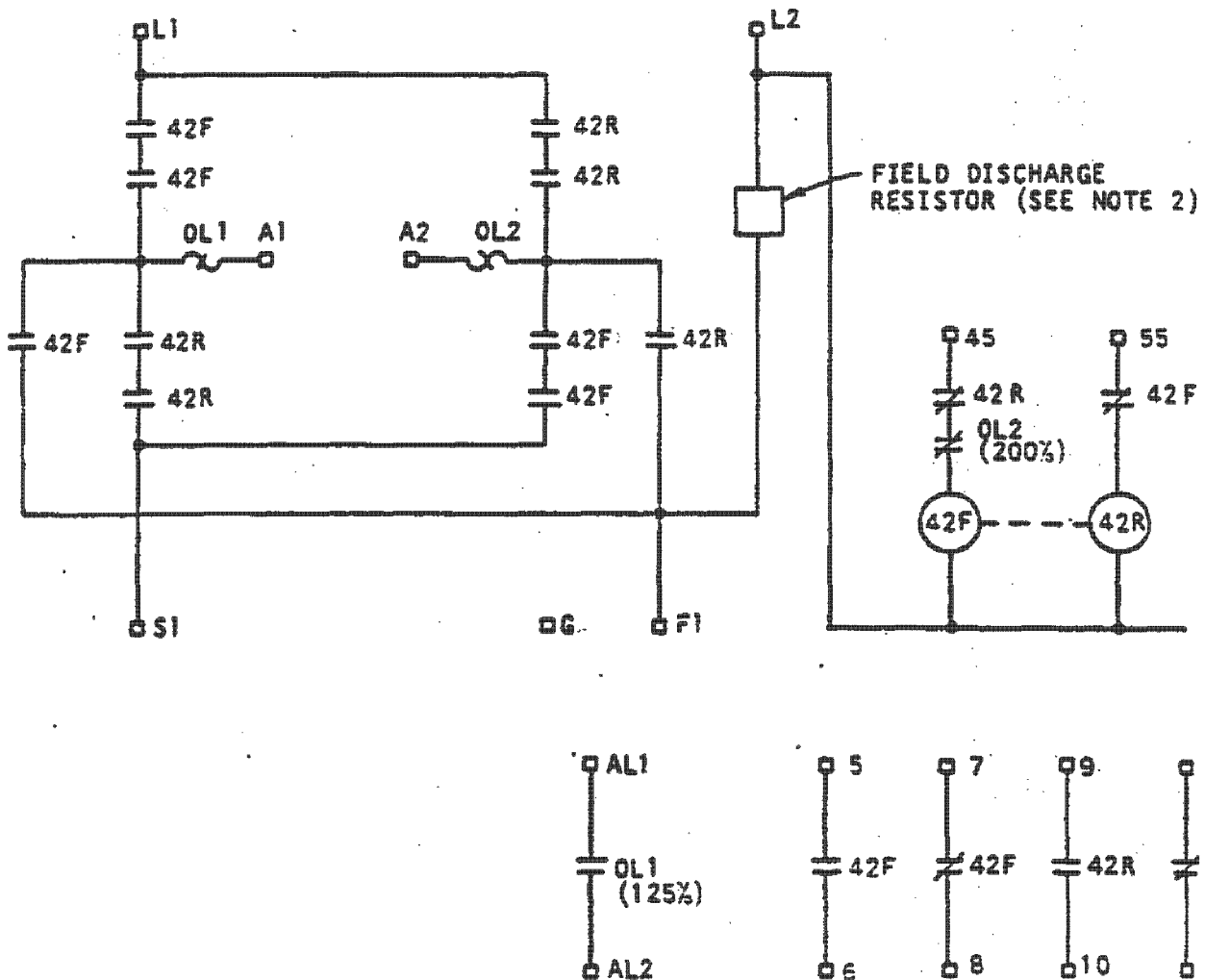
Starter contact developments, control wiring, and terminal markings shall be as indicated on the Separately Mounted DC Motor Starter drawings included at the end of this subsection.

16B1.4 QUANTITIES. The quantity of locally mounted motor starters furnished and installed under these specifications shall be as directed by the Site Construction Manager.

16B1.5 INSTALLATION. Installation shall be in accordance with the drawings and Section 16C.

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16B1-2

125VDC STARTER 1SGJ-MOS-0001
250VDC STARTER 1SGA-MOS-0019



NOTES:

1. THIS DRAWING APPLIES TO BOTH 125 VOLT DC AND 250 VOLT DC MOTOR STARTERS.
2. FIELD DISCHARGE RESISTORS SHALL BE AS FOLLOWS:
125V DC STARTER 1000 OHM, 20 WATT
250V DC STARTER 1500 OHM, 50 WATT
3. 125V MOTOR IS .7 HP, 6.3 FLA, 33.5 LRA
4. 250V MOTOR IS 5.8 HP, 20 FLA, 130 LRA

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9255

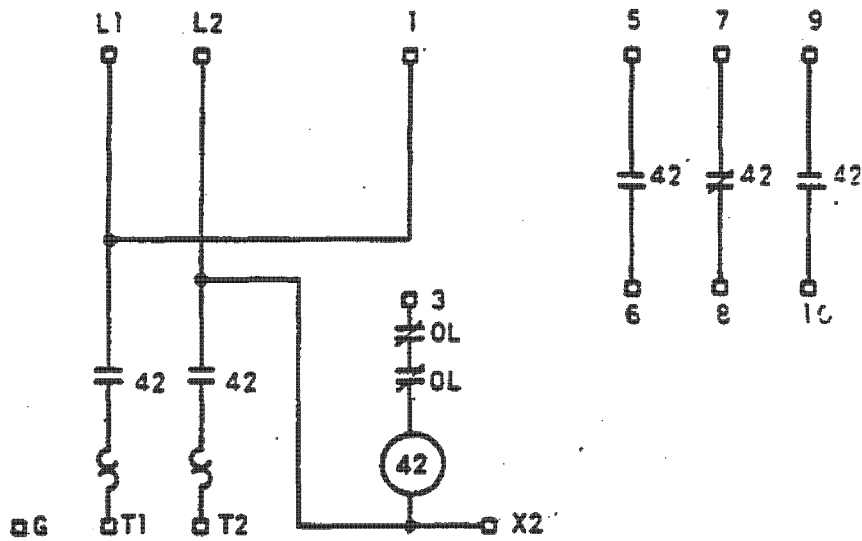


INTERMOUNTAIN
POWER PROJECT

SEPARATELY MOUNTED
DC MOTOR STARTERS

1681-3

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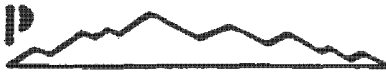


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CONSULTING ENGINEERS



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INTERMOUNTAIN
POWER PROJECT

SEPARATELY MOUNTED
120V AC MOTOR STARTER

16B1-4

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Subsection 16B2 - SEPARATELY MOUNTED PUSH-BUTTON AND SELECTOR SWITCH
CONTROL STATIONS

16B2.1 GENERAL. The separately mounted push-button and selector switch control stations described below shall be furnished and installed as directed by the Site Construction Manager.

16B2.2 DESCRIPTION. Control stations shall be as listed in the Local Switch Station List included with and bound separately from these specifications. Each control station shall have heavy-duty, oiltight push buttons, selector switches and/or indicating lights in NEMA enclosures. All conduit openings shall be 3/4 inch conduit unless otherwise specified or indicated on the drawings. Indicating lights shall be full voltage type. The location of each unit in the station shall be as indicated in the Local Switch Station List. All "start" and "close" push buttons shall be black with black escutcheons, and all "open" and "stop" push buttons shall be red with red escutcheons. All other escutcheons shall be black. Escutcheons shall be standard size or oversize as required.

The control station enclosure type, mounting, unit location, unit type, and escutcheons shall be as directed by the Site Construction Manager.

Each control station shall have a suitable nameplate on its front cover. Nameplate engraving shall be as directed by the Site Construction Manager.

The shipping marks on each control station shall be the same as the nameplate engraving.

16B2.3 MANUFACTURER. The separately mounted push buttons and selector switches shall be manufactured by the Allen-Bradley Company.

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Section 16C - ELECTRICAL EQUIPMENT ERECTION

16C.1 GENERAL. This section covers erection work for all electrical equipment installed or furnished and installed under these specifications.

Erection work shall include receiving, unloading, storage, removal from storage, hauling, cleaning, erection on foundations, and other work necessary to place all equipment into successful operation.

In addition, erection work shall include complete assembly of equipment shipped unassembled; dismantling and reassembly of equipment to make adjustments; and provision of personnel, equipment, and assistance to the Site Construction Manager in testing and placing the equipment into operation.

Erection procedures not specified herein shall be in accordance with the recommendations and drawings of the equipment manufacturer.

16C.2 MISCELLANEOUS MATERIAL. All miscellaneous materials shall be furnished as required for the complete erection of the equipment. These materials shall include, but shall not be limited to, grout, shims, wedges, dowels, anchors, supports, bolting, gaskets, packing, welding rod, and consumable gases.

16C.3 EQUIPMENT PROTECTION. All equipment shall be protected from damage of any kind from the time it is unloaded until it is ready for initial operation.

During the erection period, all equipment having drive motors or rotating parts shall be protected with a weatherproof flame resistant sheeting which completely covers the exposed parts of the equipment. Sheeting shall be PYRO-KURE 613 as manufactured by the Sisalkraft Waterproof Papers, Laminated and Coated Products Division, St. Regis Paper Co., Attleboro, Massachusetts, or acceptable equal.

Equipment shall be suitably protected from weld spatter during construction.

Equipment housed or covered with glass or equipped with easily broken components shall be protected as required to prevent damage throughout the construction period.

Machine finished surfaces, polished surfaces, or other bare metal surfaces which are not to be painted, such as machinery shafts and couplings, shall be provided temporary protection during storage and construction periods by a coating of No-Ox-Id 558 as manufactured by Sanchem Inc., Chicago, Illinois or acceptable equal rust preventive compound.

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16C.4 CLEANING. The exterior and interior surfaces of each equipment item shall be cleaned of sand, dirt, and other foreign materials after its removal from storage and immediately before its movement to its final location.

Before initial operation of individual items of equipment, the Contractor shall remove all dirt, mortar, and other material which has been spilled, misplaced, or otherwise has been allowed to mar the finish surfaces. The interior of all electrical equipment, including relays and electrical contacts, shall be thoroughly wiped and vacuumed clean before the equipment is energized.

16C.5 MAINTENANCE TOOLS. The Contractor shall use special tools furnished with equipment only when authorized by the Site Construction Manager. All special tools furnished with equipment for maintenance shall be stored as directed by the Site Construction Manager.

16C.6 MANUFACTURERS' INSPECTION AND SUPERVISION. The services of a trained manufacturer's representative to inspect and advise during the installation of the equipment will be provided if determined necessary by the Site Construction Manager.

The service described above will be provided as determined necessary by the Site Construction Manager for proper installation of the equipment. Availability of these services shall not relieve the Contractor of responsibility for technical supervision of his construction personnel.

The Contractor shall furnish all necessary labor to perform tests or inspections as required by the manufacturer's representative.

The presence of a manufacturer's representative shall not relieve the Contractor of responsibility for the work under these specifications.

16C.7 LOCATION TOLERANCES. Equipment shall be located within 1/8 inch of the dimensional location indicated on the drawings unless otherwise permitted by the Site Construction Manager.

16C.8 ALIGNMENT. Rigid components such as bus, bus duct, throat connections, and enclosures shall be aligned and connected with special care to prevent excessive stress in joints, supports, and connections.

Equipment with moving parts such as switches, circuit breakers, and switch operating mechanisms shall be carefully aligned to assure free mechanical operation.

16C.9 BOLTED ELECTRICAL CONNECTIONS. Where bolted connections are made to aluminum, the aluminum surface shall be thoroughly cleaned with a wire

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brush, then coated with joint compound and thoroughly brushed again through the compound. Additional compound shall then be added and the joint bolted together. Joint compound shall be Alcoa No. 2.

Where bolted connections are made between copper or brass surfaces, the metal surfaces shall be thoroughly cleaned and coated with Penetrox A as manufactured by Burndy Corp., Norwalk, Connecticut or No-Ox-Id A compound as manufactured by Sanchem Inc., Chicago, Illinois.

The tightness of each bolt in each factory made bolted electrical connection shall be checked during erection and connection of the equipment.

It shall be the Contractor's responsibility to certify that the tightness of each bolt in all bolted electrical connections, factory or field, is in accordance with the manufacturer's recommendations.

Bolted electrical connections shall be tightened with manual torque wrenches. Torque wrenches shall be so constructed that they will visually or audibly indicate when the proper torque is reached. The accuracy of each torque wrench shall be checked by a testing laboratory acceptable to the Site Construction Manager immediately prior to its use on equipment erected under these specifications.

16C.9.1 Torque Values. If the equipment manufacturer's erection instructions do not include recommended torque values for bolt tightening or specify an alternate method for tightening bolted electrical connections, torque values shall be in accordance with those listed in the table which follows.

TORQUE VALUES FOR DRY, UNPLATED, NONLUBRICATED BOLTS

<u>Bolt Size</u>	<u>18-8 Stain- less Steel</u> in.-lb	<u>Brass</u> in.-lb	<u>Silicon Bronze</u> in.-lb	<u>Aluminum 24ST-4</u> in.-lb	<u>316 Stain- less Steel</u> in.-lb
1/4"-20	75.2	61.5	68.8	45.6	78.8
1/4"-28	94.0	77.0	87.0	57.0	99.0
5/16"-18	132	107	123	80	138
5/16"-24	142	116	131	86	147
3/8"-16	236	192	219	143	247
3/8"-24	259	212	240	157	271
7/16"-14	376	317	349	228	393
7/16"-20	400	327	371	242	418

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<u>Bolt Size</u>	<u>18-8 Stain- less Steel</u> in.-lb	<u>Brass</u> in.-lb	<u>Silicon Bronze</u> in.-lb	<u>Aluminum 24ST-4</u> in.-lb	<u>316 Stain- less Steel</u> in.-lb
1/2"-13	517	422	480	313	542
1/2"-20	541	443	502	328	565
9/16"-12	682	558	632	413	713
9/16"-18	752	615	697	456	787
5/8"-11	1110	907	1030	715	1160
5/8"-18	1244	1016	1154	798	1301
3/4"-10	1530	1249	1416	980	1582
3/4"-16	1490	1220	1382	958	1558
7/8"-9	2328	1905	2140	1495	2430
7/8"-14	2318	1895	2130	1490	2420
1"-8	3440	2815	3185	2205	3595
1"-14	3110	2545	2885	1995	3250

16C.9.2 Connection Bolt Tightness Check. The tightened bolts in electrical connections shall be checked at random as selected by and in the presence of the Site Construction Manager. The Contractor shall provide calibrated hand torque wrenches and the necessary platforms, equipment, and personnel for the random check.

The number of bolts checked shall be acceptable to the Site Construction Manager based upon his observance of the quality and completeness of the tightening operations. A minimum of 10 per cent of the bolts in each connection, but not less than two bolts in each connection, shall be checked.

The Contractor shall be responsible for coordinating the checking of bolt tightness so that minimum interference with equipment erection and connection will be experienced. Removal of covers and similar dismantling of equipment to permit the Site Construction Manager to witness the testing of bolt tightness of enclosed connections shall be part of the work included under these specifications.

Checking of tightness of electrical connections in the presence of the Site Construction Manager is intended to assist the Contractor in avoiding the expense of repairing costly connection failures. This check shall not relieve the Contractor of complete responsibility for the integrity of the electrical connections.

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The Contractor shall maintain a bolt tightening verification log for all bolted electrical connections. The log shall be periodically revised by the Contractor's Quality Control Engineer and audited by the Site Construction Manager.

16C.10 FERROUS WELDER QUALIFICATION. All workmen performing ferrous welding of any kind shall be qualified according to the American Welding Society Publication AWS D1.1-85, Structural Welding Code.

16C.11 LUBRICATION. The Owner will furnish all oils, greases, and other lubricants required to place equipment in operation. The Contractor shall apply lubricants in accordance with the manufacturer's recommendations. The lubricants used shall be acceptable to the Site Construction Manager.

16C.12 EQUIPMENT FINISH. Surfaces of most electrical equipment, such as panels, switchgear, transformers, and circuit breakers, are finished at the factory. Great care shall be exercised to prevent damage to this original finish during installation of the equipment and during construction work.

If the factory finish is damaged during the course of construction, the entire surface of the damaged component shall be refinished by and at the expense of the Contractor.

The refinished surface shall be equivalent in every respect to the original surface, including color, texture, and smoothness. Refinishing paint, if furnished with the equipment, may be used; otherwise, the paint shall be obtained from the equipment manufacturer.

16C.13 GALVANIZED SURFACE COATINGS. All galvanized surfaces on which the galvanizing is removed by cutting, drilling, or by any other operation shall be regalvanized with "Zinc Rich" coating as manufactured by ZRC Chemical Products Company, Quincy, Massachusetts; or with IDEAL Catalog Number 40-630 Zinc Cold galvanizing or acceptable equal. The Contractor shall furnish this protective material and shall apply it in the field to any surface where the galvanized coating is broken or removed either intentionally or unintentionally.

16C.14 INSULATING OIL. The Contractor shall accept all insulating oil for oil insulated equipment from the carriers at the jobsite and shall transport, store, filter, and install the oil in the equipment.

As soon as possible after insulating oil is received at the jobsite, the Contractor shall withdraw a test sample of oil from each individual shipping container and from each equipment tank which contains insulating oil. Samples shall be withdrawn and tested in the presence of the Site Construction Manager.

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Sampling shall be in accordance with the requirements of ASTM D923. Oil samples shall be tested by the Contractor in accordance with ASTM D877 for dielectric acceptance under these specifications and with ASTM D117 if other oil tests are required by the Site Construction Manager.

Oil dielectric strength shall not be less than 28 kV prior to acceptance from the equipment supplier. If oil fails to meet dielectric requirements specified prior to acceptance, it will be dried by and at the expense of the supplier.

The Contractor shall be responsible for preservation of the dielectric strength of insulating oil received at the jobsite and accepted.

The Contractor shall again test the insulating oil from each container immediately before it is transferred into the equipment. A sample of oil shall be taken from each container and tested according to the procedures previously specified. Oil which does not test at least 28 kV shall be dried by and at the expense of the Contractor. Oil tested and found satisfactory and oil dried until it is satisfactory may then be installed in equipment.

Apparatus and material required for transferring oil to equipment shall include a filter and oilproof synthetic rubber hose with black iron fittings as required. Natural rubber hose shall not be used. Equipment shall be clean and dry to prevent contamination of the oil. Oil shall not be transferred during inclement weather. Where vacuum filling is recommended by the equipment manufacturer, a vacuum pump and fittings of the proper capacity shall be furnished by the Contractor.

Equipment shall be filled in accordance with the manufacturer's recommendations. After the oil has been in the equipment at least 8 hours, a sample of oil shall be taken from the sampling valve at the bottom of the tank and tested as above. If the oil fails to test at least 26 kV, the oil shall be dried and refiltered until it will meet this test. Another dielectric test shall be made on the oil immediately prior to placing the equipment in service. Should the oil fail this test, it shall be dried, refiltered, sampled, and tested by the Contractor until it does test at least 26 kV.

All apparatus and material required for filtering, handling, testing, and transferring insulating oil from containers to equipment shall be furnished by the Contractor. Equipment used to transport the oil shall be subject to the acceptance of the Site Construction Manager.

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The following safety precautions shall be observed during oil filling operations.

- a. Ground all tanks, storage drums, pumping and filtering equipment, shielded hoses, and receiving vessels to a solid common ground.
- b. Ground all exposed terminals and conductors on transformers and circuit breakers to the same ground. Where transformers are to be partially filled before the bushings are installed and where there are no exposed terminals or conductors, install a temporary metallic ground from one side of each winding to a bolt on the case.
- c. Wait 8 hours after filling before removing these grounds.
- d. After vacuum filling a transformer, relieve the vacuum with nitrogen to prevent air from mixing with the oil vapor and creating an explosive atmosphere.
- e. All tanks (such as circuit breaker and tap changer compartments not blanketed with nitrogen) which may have an accumulation of arc byproduct gases must be purged thoroughly, prior to filling or recirculating operations.

16C.15 PANELBOARDS. All panelboards shall be installed so that branch circuit protective devices are not more than 6 feet above the finished floor or grade. Panelboards shall be installed in accordance with the following articles.

16C.15.1 Cabinets. The cabinets shall be leveled and securely fastened to the mounting surface, utilizing all of the mounting holes provided in the panelboard cabinets. The mounting surfaces shall be adjusted as required to maintain the cabinets in a true vertical plane.

16C.15.2 Panel Interior. Each cabinet shall be installed, conduits connected, and wires pulled before the panel interior is installed. Each panel interior shall be carefully inspected, and all connections shall be tightened. The panel interior shall then be mounted in the cabinet using all of the mounting provisions furnished. The panelboard interior shall then be connected, with wires tightly secured in the terminals provided and with unnecessary lengths of wire eliminated. Wiring shall be neatly arranged in the gutters. A heavy cardboard panel front shall be temporarily secured to the front of the panelboard to protect the interior from dirt or damage until the permanent metal front is installed.

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16C.15.3 Panelboard Fronts. Each panelboard front shall be carefully aligned and adjusted until its edges are parallel to the panelboard interior and the building lines, and then shall be firmly secured with the fasteners provided.

The directory shall be accurately and neatly completed to permit ready location of the protective devices controlling circuit loads.

16C.16 COMMUNICATION SYSTEM. All intercommunication circuits shall be run in a rigid conduit system separate from other power, control, and lighting raceway systems except for routing as required in the duct bank system for access to remotely located stations.

Raceway and cable installations shall conform to applicable requirements of the RACEWAY and CONDUCTOR sections.

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Section 16D - RACEWAY

16D.1 GENERAL. This section covers furnishing and field installation of a complete raceway system in accordance with these specifications and the drawings.

Raceways shall be furnished in quantities sufficient for a complete installation as indicated on the drawings and in these specifications.

The raceway system is defined to include conduit, flexible conduit, continuous rigid cable supports called "cable tray" herein, underground duct, wireway, cabinets and boxes, and all materials and devices required to install, support, secure and provide a complete system for support and protection of electrical conductors.

16D.1.1 Raceway Installation Information. Information necessary for the installation of raceway will be provided by the Site Construction Manager.

16D.2 CODES AND STANDARDS. Raceway system materials and devices furnished shall be in accordance with applicable standards of ANSI, NEMA, and UL. Raceway system components shall be installed in accordance with applicable requirements of the NEC. In case of conflict between the requirements of any of the above referenced codes and standards and the requirements of these specifications, the requirements of these specifications shall govern. All materials and devices shall be in accordance with the applicable requirements of the Federal "Occupational Safety and Health Standards."

16D.3 GENERAL INSTALLATION REQUIREMENTS. The installation specifications included in this article apply to all raceway system components.

16D.3.1 Routing of Above Grade Raceway. Electrical cable tray shall be routed as indicated on the drawings. The Contractor shall field route conduit and wireway according to the general routing indicated on the drawings and shall coordinate conduit and wireway locations with other equipment and structures. Wherever practical, raceway shall be routed so that, except where it is changing elevation or being lowered to enter equipment, the lowest part of the raceway, including its associated supports and appurtenances, is at least 6'-8" above the closest floor or walking surface beneath it. Raceway, including its associated supports and appurtenances, routed above work areas, walkways, platforms, and aisles shall be at least 6'-8" above the walking surfaces. Raceway, including its associated supports and appurtenances, located at least 6'-8" above the closest walking surface beneath it, may be routed a reasonable distance away from the supporting wall, ceiling, or structural member so

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long as the specified support is provided, interference with other equipment and structures is avoided, and the routing is acceptable to the Site Construction Manager. Raceway, including its associated supports and appurtenances, which must be routed closer than 6'-8" above the closest walking surface beneath it shall be routed as close as possible to surfaces of walls, columns, and the equipment served.

16D.3.2 Brackets. Bracket supports as detailed on the drawings shall be used where specifically indicated and may be substituted for other type hangers where acceptable to the Site Construction Manager.

16D.3.3 Anchors. Where supports for raceways, boxes, and cabinets are mounted on concrete surfaces, they shall be fastened as indicated on the drawings.

16D.3.4 Insulation. All supports for raceway connected to equipment, piping, raceways, etc., that have been electrically insulated from contact with other structures shall be properly installed to prevent shunting of the insulation.

16D.3.5 Sleeves and Openings. The Contractor shall be responsible for all required openings. Required openings not provided during structure fabrication shall be provided by the Contractor using a hacksaw, a hole saw, or a core drill subject to acceptance by the Site Construction Manager. Openings in concrete floors and walls for single conduit shall be cut by the Contractor with core drills and the conduit grouted in place after being installed.

16D.3.5.1 Openings Through Steel Beams. Conduit may be routed through building steel only when each such routing is acceptable to the Site Construction Manager. Holes required for conduit passages shall be drilled or sawed, not burned.

16D.3.5.2 Openings Through Grating. Field cutting of grating will be allowed only where acceptable to the Site Construction Manager. Alternate routing of raceways should be used to avoid conflict with grating. If field cutting is absolutely necessary, the openings shall be made as directed by the Site Construction Manager.

16D.3.5.3 Finishing Boxouts. Openings that have been cut through walls and floors of masonry or concrete for the passage of raceways shall be finished either by grouting around the conduit or by grouting 3/16 inch thick steel bands around the periphery of the openings. Where sleeves or bands are installed in floors, they shall project 4 inches above the finished floors. Openings shall be finished so that wall or floor fire ratings are maintained.

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16D.3.5.4 Finishing Openings Beneath Equipment. The Contractor shall finish openings beneath Unit 1 and common equipment. Openings beneath equipment shall be closed with Carboline Pyrofoam 700 or acceptable equal where the cables are in conduits and the conduits project through the openings.

Where the cables entering the equipment are not in enclosing raceways, the openings shall be closed with Dow Corning 3-6548 silicone RTV foam, Manville Type 103 Cera Form board, or acceptable equal flame retardant materials. The Cera Form boards shall be not less than 1 inch thick and shall be cut to fit closely around the outside surfaces of the cable where the cable passes through the boards. The boards shall be securely placed in the floor opening and all openings around the cables and the boards shall be sealed with Manville Cerablanket or acceptable equal and all exposed surfaces of the board and Cerablanket shall be covered with a 1/8 inch thick coating of Carboline Intumastic 285.

Openings shall not be closed until all the cables through the openings have been installed and tested and when directed by the Site Construction Manager.

Unused openings beneath equipment shall be closed with Carboline Pyrofoam 700, Manville Cera Form board coated with a 1/8 inch thick coating of Carboline Intumastic 285, Dow Corning 3-6548 silicone RTV foam, or acceptable equal flame retardant materials.

Installation of materials shall be in accordance with the manufacturer's recommendations. The materials shall be finished to provide a smooth, neat appearance.

16D.3.6 Extensions of Building Steel to Support Raceway. Extensions of building structures to support raceway shall be of the same material as the structure being extended and shall be finished to match the finish of the extended structure. Structural steel shall be as specified in Section 5A and as indicated on the drawings.

16D.3.7 Beam Clamps. Beam clamps for attachment of hanger rods to structural steel shall be electrogalvanized steel as manufactured by Unistrut, Globe Strut, or acceptable equal. Beam clamps shall be able to transfer a load equal to 15 ksi times the gross area of the rod, with a minimum factor of safety of 3.0. All beam clamps shall be furnished with an appropriate safety rod to prevent slippage during a seismic event, or as acceptable to the Site Construction Manager.

16D.3.8 Tray Fasteners. The tray shall be securely fastened to tray supports at all locations. The fastening method shall be as indicated on the drawings.

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16D.3.9 Welding. All welding shall completely fuse the welded member to the supporting steel and shall be neat in appearance. All welders shall be qualified in accordance with these specifications.

Unless otherwise indicated on the drawings, clamps shall be used for making attachments to structural steel for installation purposes wherever possible. Welded lugs will be permitted only when acceptable to the Site Construction Manager.

All temporary supports which have been welded to the building steel shall be removed as promptly as possible. After removal, the roughened surface of the building steel shall be ground smooth and a protective primer paint applied equal to that which was initially applied in the shop.

16D.3.10 Use of Unfinished Raceway. Unfinished runs of raceway shall not be used. Supports and connections for each raceway run shall be completed prior to the pull-in of any pulling line or conductor.

16D.3.11 Hazardous Areas. Hazardous areas for lighting and communications are defined on the lighting drawings. Hazardous areas for all other purposes are as defined in the following list. All raceway installations in hazardous areas shall be in accordance with Article 500 of the National Electrical Code. In Group G areas the hazard will be coal dust.

<u>Area Description and Raceway Use</u>	<u>Hazard Classifications</u>
Coal handling building HVAC rooms, electrical equipment rooms; and control rooms	None
Area around Conveyors 1A and 1B in the Coal Car Unloading Building and in the tunnel portion of Conveyors 2A and 2B; area around Conveyor 7 and access/egress thereto	Class II, Division 1, Group G and Class I, Division 2, Group D except ventilating fan power and control which shall be Class II, Division 1, Group G and Class I, Division 1, Group D
All other coal handling areas except the outdoor, uncovered portion of Conveyor 6	Class II, Division 1, Group G
The outdoor, uncovered portion of Conveyor 6	None

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Area Description
and Raceway Use

Hazard
Classifications

The entire Hydrogen Generation Building and any area within 15 feet of the hydrogen storage tanks

Class I, Division 2,
Group B

Any area within 10 feet horizontally of and 18 inches vertically of the fuel oil unloading facility

Class I, Division 2,
Group D

All other plant areas where raceway will be installed under this Contract

None

16D.4 ELECTRICAL CONDUIT SYSTEM. An electrical conduit system shall be furnished and installed in accordance with the drawings and the following specifications. Conduit shall include all fittings and supports and all flexible conduit and fittings.

16D.4.1 Conduit Materials. Electrical conduit and associated materials shall conform with the requirements of the following paragraph articles.

Conduit which will not be encased in concrete shall conform to the following six sets of requirements. For the purposes of this article, Article 16D.4.1, only, indoors shall be defined as any part of an enclosed and heated area; all other areas shall be defined as outdoors. Where conflicts occur within the following six sets of requirements, the requirement with the lowest number shall govern.

1. Conduit material shall conform to the drawings where conduit material is specifically stated for an area or for particular raceways.
2. All conduit installed outdoors or in hazardous areas and all conduit not used in lighting or communication circuits shall be rigid steel conduit.
3. Conduit for lighting and communication circuits for indoor or nonhazardous areas can be electrical metallic tubing or rigid at the Contractor's option, unless otherwise noted on the drawings.
4. Conduit for lighting and communication circuits installed in outdoors or in hazardous areas shall be rigid steel, unless otherwise noted on the drawings.

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5. Rigid conduit shall be rigid steel unless otherwise directed by the Site Construction Manager.

16D.4.1.1 Rigid Aluminum Conduit. Aluminum conduit and couplings shall be rigid type conforming to ANSI C80.5 and shall bear the Underwriters' Laboratories label.

16D.4.1.2 Rigid Steel Conduit. Steel conduit, couplings, and elbows shall be hot-dip galvanized rigid mild steel in accordance with ANSI C80.1 and UL 6. The conduit interior and exterior surfaces shall have a continuous zinc coating with a transparent overcoat of enamel, lacquer, or zinc chromate. Rigid steel conduit shall be as manufactured by Triangle PWC, Incorporated or acceptable equal.

16D.4.1.3 Plastic Conduit. Plastic conduit shall be Schedule 40, high impact, polyvinyl chloride and shall be used with plastic conduit fittings. Each length of conduit shall be furnished with one standard coupling. Joints shall be made with solvent cement. All additional conduit couplings, factory bends, plastic-to-steel conduit adapters, solvent cement, and special fittings for the complete conduit system shall be included. Couplings shall have a center stop to ensure proper seating.

16D.4.1.4 Electrical Metallic Tubing. Electrical metallic tubing, including elbows and bends, shall be zinc coated mild steel in accordance with the requirements of ANSI C80.3 and UL 797. The exterior surfaces of the tubing shall have a continuous zinc coating.

16D.4.1.5 Couplings and Thread Protectors. Each length of threaded conduit shall be complete with a coupling on one end and a thread protector on the other. The thread protector shall have sufficient mechanical strength to protect the threads during normal handling and storage.

16D.4.1.6 Liquidtight Flexible Conduit. All liquidtight flexible conduit shall be plastic jacketed, galvanized steel, Sealtite Type EF for general service areas or Type HC for high temperature locations.

16D.4.1.7 Flexible Metallic Conduit. Flexible metallic conduit shall be galvanized steel, Anaconda Type DE-710 or acceptable equal.

16D.4.1.8 Metal Conduit Fittings. All metal conduit fittings shall conform to the requirements of ANSI/NEMA FBl and UL 514 where these standards apply. Galvanized iron or galvanized steel fittings shall be used with steel conduit. Zinc coated steel fittings shall be used with

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steel tubing. Electrical metallic tubing fittings shall be compression type, UL approved for raintight applications. All fittings for aluminum conduit shall be copper free aluminum or aluminum alloy. Fittings which are connected to both steel and aluminum conduit shall be galvanized steel, galvanized iron, or copper free aluminum or aluminum alloy.

16D.4.1.9 Liquidtight Flexible Conduit Fittings. All liquidtight flexible conduit fittings shall be galvanized steel, Appleton Type STN, STB, or acceptable equal, and shall bear the UL label.

16D.4.1.10 Flexible Metallic Conduit Fittings. Flexible metallic conduit fittings shall be galvanized malleable iron, Appleton Squeeze Type or acceptable equal.

16D.4.1.11 Special Fittings. Conduit sealing, explosionproof, dust-proof, and other types of special fittings shall be provided as required by the drawings and these specifications, and shall be consistent with the area and equipment with which they are associated. Fittings installed outdoors or in damp locations shall be sealed and gasketed. Outdoor fittings shall be of heavy cast construction. Hazardous area fittings and conduit sealing shall conform with NEC requirements for the area classification.

16D.4.1.12 Bushings. Insulated bushings with insulating inserts in metal housings shall be provided for the termination of all conduit not terminated in hubs and couplings. Grounding type insulated bushings shall be provided for all conduit containing power circuits and all conduits located in hazardous areas. Standard bushings shall be galvanized.

16D.4.1.13 Locknuts. One interior and one exterior locknut shall be provided for all conduit terminations not provided with threaded hubs and couplings. Locknuts shall be designed to securely bond the conduit to the box when tightened. Locknuts shall be so constructed that they will not be loosened by vibration.

16D.4.1.14 Unions. Conduit unions shall be acceptable to the Site Construction Manager. Watertight conduit unions shall be Crouse-Hinds Type UNF or acceptable equal.

16D.4.1.15 Raintight Conduit Hubs. Raintight conduit terminating hubs, where indicated on the drawings or required by these specifications, shall be Efcor "Water-Tite" rigid conduit hubs or acceptable equal. Malleable iron hubs shall be used for steel conduit and aluminum hubs shall be used for aluminum conduit.

16D.4.1.16 Combination Fittings. Combination fittings used to connect rigid steel conduit to electrical metallic tubing shall have a threaded throat to receive the rigid steel conduit and shall have a compression type throat to receive the electrical metallic tubing.

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16D.4.1.17 Plastic Coated Conduit. Plastic coated conduit shall be Plasti-Bond as manufactured by Rob Roy Industries, or acceptable equal. All elbows shall be factory made. All conduit bodies, unions, hubs, connectors, and other accessories for plastic coated conduit shall be plastic coated and shall be of the same manufacturer as the conduit.

16D.4.2 Conduit Supports. Conduit supports shall be furnished and installed in accordance with the drawings and these specifications. Support material shall comply with the requirements which follow.

16D.4.2.1 Hanger Rods. Hanger rods shall be 1/2 inch diameter electro-galvanized threaded steel rods except that 3/8 inch diameter electrogalvanized hanger rods may be used for single runs of 1/2 inch conduit and single runs of electrical metallic tubing up to 3/4 inch.

16D.4.2.2 Conduit Clamps. Conduits in single runs or groups of two shall be supported by one-hole cast metal clamps and clamp-backs. They shall be galvanized malleable iron or acceptable equal cast ferrous metal for steel conduit or tubing and shall be cast aluminum for aluminum conduit.

Supports for banks of three or more conduits shall be constructed of support channels (Unistrut, Kindorf, or acceptable equal) with associated conduit or tubing clips. Support channels and hardware shall be in accordance with the requirements of Section 5B. Both support channels and conduit clips shall be aluminum for aluminum conduit. Support channels for conduit banks containing both aluminum and steel conduit shall be galvanized steel.

16D.4.2.3 Supports for Plastic Coated Conduit. Supports for plastic coated conduit, including U-bolts, channel, pipe straps, channel nuts, and hanger rod shall be plastic coated and shall be of the same manufacturer as the plastic coated conduit.

16D.4.3 Conduit Installation. Conduit and associated materials shall be installed as indicated on the drawings and as described in these specifications.

16D.4.3.1 Routing. Except as otherwise specified or indicated on the drawings, all conduit shall be installed in exposed runs parallel or perpendicular to dominant surfaces with right angle turns made of symmetrical bends or fittings. Conduit shall not be installed on the outside face of exposed columns, but shall be routed on the web or on the inside of a flange of the column. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.

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Conduit shall be located at least 6 inches from hot water or steam pipes, and from other hot surfaces.

All conduit field routing shall be acceptable to the Site Construction Manager. Routing not acceptable shall be rerouted and replaced without expense to the Owner.

16D.4.3.2 Moisture Pockets. Moisture pockets shall be eliminated from conduits. If water cannot drain to the natural opening in the conduit system, a hole shall be drilled in the bottom of a pull box or a "C-type" conduit fitting provided in the low point of the conduit run.

16D.4.3.3 Couplings and Unions. Metal conduit shall be joined by threaded conduit couplings with the conduit ends butted. The use of running threads will not be permitted.

Where metal conduit cannot be joined by standard threaded couplings, conduit unions or split couplings may be used if their location is acceptable to the Site Construction Manager. Only ground seat type watertight unions shall be used outdoors or where the union may be submerged.

Where Erickson type couplings or similar unions which do not have ground seats are used in vertical or inclined conduit runs, the coupling nut shall be installed uppermost to prevent the entrance of water into the union.

16D.4.3.4 Bends and Offsets. A run of conduit shall not contain more than the equivalent of four quarter bends, including those immediately at outlets or fittings. Bends in conduit or tubing shall be made without reducing the internal diameter of the conduit. The use of a pipe tee or vise for bending conduit or tubing will not be permitted. The inside radius of conduit bends shall be not less than six times the inside diameter of the conduit. Conduits or tubing deformed or crushed in any way shall be removed from the jobsite.

16D.4.3.5 Cutting and Threading. The plane of all conduit ends shall be square with the center line. Where threads are required, they shall be cut and cleaned prior to conduit reaming. The ends of all conduit and tubing shall be reamed to remove all rough edges and burrs.

A cutting oil shall be used in threading operations. The dies shall be kept sharp and provisions shall be made for chip clearance.

All steel conduit, after threading, shall be regalanized in accordance with Article 16C.13.

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16D.4.3.6 Connections to Boxes and Cabinets. Conduit shall be securely fastened to all boxes and cabinets. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit. The locknuts both inside and outside shall then be tightened sufficiently to bond the conduit securely to the box. Locknuts on EMT box connectors shall be tightened securely to bond the connectors.

The Contractor shall fabricate all required openings not furnished with equipment. This shall include installation of conduit connections for hazardous area and nonhazardous area boxes and cabinets.

All conduit entering enclosures outdoors or in wet areas shall enter through Efcor "Water-Tite" hubs, or acceptable equal, or threaded openings.

16D.4.3.7 Cleaning. Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the Site Construction Manager, the conduit shall be replaced.

16D.4.3.8 Liquidtight Flexible Conduit. Liquidtight flexible conduit inserts not greater than 30 inches in length, or as approved by the Site Construction Manager, shall be installed at the locations specified in this article.

Flexible conduit inserts shall be installed in all conduit runs which are supported by both building steel and by structures subject to vibration or thermal expansion. This shall include locations where conduit supported by building steel enters or becomes supported by the turbine generator foundation and where conduit supported by building steel or foundation becomes supported by steam generator framing.

Flexible conduit shall be installed in conduit runs which cross expansion joints or which connect to building supported independent structures, such as heat exchangers, storage tanks, or ash hoppers.

The necessity for flexible conduit inserts should be considered in all long conduit runs where differential expansion problems may be expected.

Special areas, such as control rooms in which external noise is to be minimized, shall have flexible conduit in conduit runs where the runs cross from the main building framing to the control room framing.

Flexible conduit shall be installed adjacent to all equipment and devices which move in relation to the supply conduit due to vibration, normal operation of the mechanism, or thermal expansion.

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The supply conduit shall be connected to pressure switches, thermocouples, solenoids, and similar devices with flexible conduit. Flexible conduit shall be installed adjacent to the motor terminal housing for motors requiring 4 inch and smaller conduit. Provision for vibration and thermal expansion at motors requiring larger than 4 inch conduit shall be accomplished by use of pendent hangers, flexible conduit other than at the motor termination, or other means acceptable to the Site Construction Manager.

16D.4.3.9 Flexible Metallic Conduit. Flexible metallic conduit inserts not greater than 6 feet in length shall be installed for light fixture tap conductors located above ceilings in finished areas.

16D.4.3.10 Plastic Conduit. Except as specified in the following paragraphs, polyvinyl chloride conduit shall be installed in accordance with the installation requirements previously specified for metallic conduit. Expansion joints for exposed conduit or buried conduit which will be exposed to temperature variations during installation shall be provided as recommended by the manufacturer.

Joints shall be unthreaded solvent cement type as recommended by the conduit manufacturer. The contact surfaces of the conduit and fitting socket shall be cleaned with Stoddard solvent, methyl ethyl ketone, or acetone, liberally coated with solvent cement, promptly and fully engaged, and either conduit or fitting rotated approximately 1/4 turn to dispel air and evenly distribute solvent cement over contact surfaces. For proper connection, total elapsed time between the start of the cement application to the surfaces being joined and final assembly of the joint should not exceed 60 seconds. The initial strength of the joint will permit continuous conduit installation; however, additional stress at the joint shall be avoided for at least 24 hours after joining.

Bends shall be made from straight conduit lengths or shall be factory fabricated. Bend radii shall be in accordance with NEC.

The conduit length for field bending shall be heated to approximately 275 F by radiant heat, hot air, or hot liquid immersion. Open flame heating will not be permitted. Special mandrels or forms shall be used to provide a smooth bend without reduction of the conduit diameter. Conduit discolored by prolonged heating will not be acceptable.

Where plastic conduit is required to be buried directly in the earth as indicated on the drawings, the conduit shall be bedded in a graded 3 inch deep soft bedding of sand or finely divided job excavated material free from debris, organic material, and stones. Backfill, to approximately 6 inches above the conduit, shall be the same as bedding material.

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16D.4.3.11 Below Grade Conduit. Steel conduit shall not be direct buried in the earth. Below grade steel conduit shall be encased with not less than 3 inches of concrete. Concrete used for conduit encasement shall contain not less than 610 pounds of cement per cubic yard. It shall contain clean and well graded aggregates and low water content. The slump shall be such that the mixture is stiff and will stand erect when placed. The concrete shall be vibrated to consolidate it around the steel and shall be slow cured for several days to provide strength and prevent shrinkage. Conduit shall be supported for encasement by steel wire hangers attached to temporary supports laid across the conduit trench. After the concrete encasement has hardened, the supports and those parts of the wire hangers not encased in concrete shall be removed.

A minimum separation of 3 inches shall be maintained between multiple conduits enclosed in the same concrete encasement but not assembled as a duct bank.

Concrete used for encasing steel conduit shall be Class B4 in accordance with Section 3A.

The Contractor shall field route conduit according to the general routing indicated on the drawings and shall coordinate conduit locations with other work. Conduit shall be accurately positioned and securely anchored before the concrete is poured to encase it.

Conduit which will be visible above the finished floor shall be straight and plumb.

Conduit which is stubbed up shall be plugged prior to pouring of concrete and shall remain plugged until the conduit is extended later.

Aluminum conduit shall not be buried or encased in concrete.

16D.4.3.12 Plastic Coated Conduit. Plastic coated conduit shall be installed in accordance with these specifications and the manufacturer's recommendations. In case of conflict between these specifications and the manufacturer's recommendations, the manufacturer's recommendations shall govern to the extent of such conflict. All damaged conduit shall be touched up with manufacturer-furnished touch-up coating compound or shall be replaced as directed by the Site Construction Manager.

16D.4.3.13 Spacing and Attachment of Supports. Except where buried in concrete, all conduit runs shall be rigidly supported. Each 2 inch and smaller conduit shall be supported within one foot of junction boxes and fittings. Support spacing along conduit runs shall be as follows.

<u>Conduit Size</u>	<u>Maximum Distance Between Supports</u>
1/2 inch and 3/4 inch	8 feet
1 inch and larger	10 feet

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Conduit clamps shall be bolted to building steel using drilled and tapped screw holes. Support channels for three or more conduits shall be welded to building steel or bolted using drilled and tapped screw holes.

16D.5 ELECTRICAL CABLE TRAY SYSTEM. Cable tray shall be installed in accordance with the drawings, the cable tray manufacturer's instructions, and the following articles.

16D.5.1 Tray Surfaces. The Contractor shall cut the trays to length as required. The trays shall be cut with saws and all surfaces over which the conductors and cables will be laid shall be ground or filed to remove any sharp edges which could cause damage to the cable jacket or insulation either during installation or in normal service.

16D.5.2 Application and Location of Supports. Cable trays shall be supported in accordance with the support locations and details indicated on the drawings. Where required by the drawings and these specifications, the Contractor shall locate, furnish, and install supplementary steel. Supplementary steel shall be attached to Owner-furnished structural steel in accordance with Section 5B unless otherwise indicated on the drawings. Maximum support spacing shall be 8'-0" on horizontal line. Tray support materials shall be in accordance with the drawings and Section 5B.

The Contractor shall furnish tray support fabrication drawings to the Site Construction Manager for review. The tray support fabrication drawings shall include all detail design of tray supports.

16D.5.3 Temporary Tray Covers. The Contractor shall furnish and install temporary tray covers for tray installed under these specifications. Temporary tray covers shall be installed over all horizontal tray which is not directly under a concrete floor. Where horizontal tray is directly under grating, temporary tray covers shall, at the Site Construction Manager's option, be installed on top of or underneath the grating. Where horizontal tray is not directly under grating, temporary tray covers shall be connected to building steel or to the tray support system. All temporary tray covers shall extend a minimum of 6 inches horizontally outside of the trays being covered. Temporary tray covers shall be 1/2 inch or thicker plywood. Temporary tray covers shall not interfere with installation of cables in the tray system. The location, attachment, and support of all temporary tray covers shall be acceptable to the Site Construction Manager.

The Contractor shall furnish all labor and materials required for installation of temporary tray covers.

Each temporary tray cover shall be installed prior to the installation of insulated cable in the tray which it protects or within 21 calendar days after tray installation, whichever is earlier.

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16D.5.4 Permanent Tray Covers. Tray covers shall be installed as directed by the Site Construction Manager.

Cable tray covers shall be notched to provide clearance around clamps, supports, and cable as required for proper fit. Notches shall be cut prior to tray cover installation and shall be cut by sawing and the edges smoothed by grinding or filing.

Except as specified otherwise herein, all straight runs of indoor vertical trays shall be installed with louvered ventilated covers 8'-0" above the floor elevation. All fittings in runs of indoor vertical tray shall be installed with solid flanged covers. All electronic cable trays shall have solid covers. Electronic cable tray includes the designation "TE" in the tray numbers indicated on the drawings; example "ITEC0006" on Drawing 9255-IEEC-E4021. All indoor horizontal trays located under grating floor or insulated pipe shall be furnished with solid covers which extend at least 2 feet beyond that part of the trays directly exposed beneath the grating floor or insulated pipe. Indoors, covers may be omitted on those lower trays of stacked ladder type trays where a covered tray at a higher elevation in the stack provides complete vertical shielding to the lower tray. All outdoor trays shall be installed with solid covers. All cable trays in the pulverizer area shall have solid covers where indicated on the drawings. All trays in the Fabric Filter Area shall have tray covers. Only cover straps or clips, provided with the covers, shall be utilized to install the tray covers. Covers shall not be installed utilizing self-tapping screws.

16D.5.5 Finishing Tray Penetrations. The Contractor shall finish all tray penetrations through fire rated or outdoor walls on all tray runs installed by the Contractor. Finishing of tray penetrations shall be in accordance with the drawings.

16D.5.6 Tray Identification. After tray installation and prior to cable installation, each tray installed by the Contractor shall be clearly identified with its raceway number as indicated on the drawings by paint stencil on both sides and at intervals not to exceed 20 feet. Lettering shall be 2 to 2-1/2 inches high.

16D.5.7 Cable Tray Barrier Strip. The Contractor shall furnish and install cable tray barrier strips, Stahlin Catalog Number B-251503 or acceptable equal, in all fiberglass cable tray. The strip shall be located 6 inches from the edge of the cable tray.

16D.6 BOXES AND CABINETS. All boxes and cabinets required throughout the electrical raceway system shall be furnished and installed in accordance with the requirements which follow.

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16D.6.1 Pull Boxes, Junction Boxes, and Cabinets. Pull boxes, junction boxes, and cabinets shall be constructed in accordance with UL 50 for their intended service. Pull boxes and cabinets shall not have knockouts. Pull boxes and junction boxes shall be furnished in accordance with these specifications and the drawings.

Enclosure type, material, and dimensions shall be as directed by the Site Construction Manager.

Unless indicated otherwise on the drawings or in these specifications, electrical enclosures, except junction boxes and pull boxes 4 inch trade size and smaller, shall be as follows.

<u>Location</u>	<u>Enclosure Type</u>
Indoor (Nonhazardous)	
Dry areas	NEMA 12
Areas where moisture conditions are more severe than those for which NEMA 12 enclosures are intended	NEMA 4
Outdoor (Nonhazardous)	NEMA 4
Hazardous areas	In accordance with the requirements of the National Electrical Code for the location

The construction of electrical enclosures located in areas subject to conditions classified in the National Electrical Code as hazardous shall be of a type designated by NEMA as suitable for the environment in which they are located.

Electrical enclosures, except junction boxes and pull boxes 4 inch trade size and smaller and other enclosures of cast metal, shall be constructed from steel plate reinforced as required to provide true surfaces and adequate support for devices mounted thereon. Panels, cabinets, and enclosures shall be of adequate strength to support mounted components during shipping and to support a concentrated load of 200 pounds on the top after erection.

Except as indicated otherwise in these specifications or on the drawings, all junction boxes and pull boxes larger than 4 inch trade size for use

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in indoor locations shall be sheet steel hot-dip galvanized after fabrication and those for use in outdoor or damp locations shall be galvanized malleable iron or acceptable equal cast ferrous metal, sheet steel hot-dip galvanized after fabrication, or sheet steel epoxy coated inside and outside after fabrication. The epoxy coating shall consist of a 2 to 3 mils thick coat of epoxy, as manufactured by ZRC Chemical Products Company, followed by two finish coats of epoxy. Each finish coat shall be a minimum of 2 mils thick. The interior of all junction boxes shall be finished with gloss white enamel or white epoxy coating as required to coordinate with the overall box finish.

Terminal blocks mounted in junction boxes shall be mounted on a sheet steel mounting backplate. Terminal blocks shall be States Type ZWM or Poweright Products, Inc., Bulletin SLD 78SF2 as manufactured by Poweright, P.O. Box 140284, Dallas, Texas 75214, sliding link terminal blocks. The mounting plate shall be finished with gloss white enamel or a white epoxy coating. Terminal blocks and other devices, if required, shall be mounted by screws with drilled and tapped mounting holes. Mounting of the back plate within the junction box shall be by nuts on a welded stud. No mounting holes may penetrate the outside surface of the box. Wiring, if required, shall be copper with Type SIS cross-linked polyethylene insulation rated 600 volts and shall be Rockbestos Firewall Type SIS, General Electric Vulkene Supreme Type SIS VW-1, or acceptable equal. Wire size shall be 12 AWG minimum except for indicating light wiring which shall be 16 AWG minimum. Other devices, if required, shall be as specified in Section 3B of these specifications.

Except as indicated otherwise on the drawings or in these specifications, all junction boxes or pull boxes 4 inch trade size or smaller in any dimension shall be galvanized malleable iron or acceptable equal cast ferrous metal for use with steel conduit, and cast aluminum for use with aluminum conduit.

16D.6.2 Outlet Boxes and Switch Boxes. All outlet boxes, switch boxes, and associated fittings shall be constructed in accordance with UL 514.

All surface mounted outlet boxes, switch boxes, and associated fittings shall be galvanized malleable iron or acceptable equal cast ferrous metal for use with steel conduit, and cast aluminum for use with aluminum conduit.

Galvanized steel boxes shall be used only in finished areas where they are completely concealed within walls or ceilings.

16D.6.3 Installation. Cabinets and boxes shall be rigidly mounted. Mounting on concrete shall be secured by concrete expansion anchors as specified in Section 5B. Mounting on steel shall be by drilled and

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tapped screw holes, or by special support channels welded to the steel. All welding shall be performed as specified in Section 5B. Cabinets shall be leveled and fastened to the mounting surface with not less than 1/4 inch air space between the enclosure and mounting surface. All mounting holes in the enclosure shall be used.

Except as prevented by the location of other work, all junction boxes and outlet boxes shall be centered on structures.

Conduit openings in boxes shall be made with a hole saw or shall be punched.

16D.6.4 Box Identification. The identification number of each junction box and pull box indicated on the junction box and pull box lists shall be stenciled on the cover of the box. The lettering shall be block type and shall be not less than 1 inch high.

16D.7 WIREWAY. Wireway shall be provided in accordance with the drawings and the requirements which follow. The types of wireway required in the various areas of the generating station are indicated on the drawings.

16D.7.1 Oiltight JIC Wireway. All oiltight wireway and associated fittings shall be oiltight type, designed for weathertight installation with neoprene gasketed hinged covers secured with external clamps. The wireway shall be fabricated of steel not less than 14 gage, shall be finished with baked satin enamel applied over a phosphated surface and shall be Joint Industry Conference Standards approved.

16D.7.2 NEMA 1 Wireway. NEMA 1 wireway shall be smooth, seamfree, without knockouts and with removable covers. The wireway and associated fittings shall be finished with baked satin enamel over phosphatized surfaces. The wireway shall be manufactured from steel not less than 16 gage, shall conform to NEMA standards and shall be listed by Underwriters' Laboratories.

16D.7.3 Installation. Wireway shall be installed in accordance with the manufacturer's instructions and as indicated on the drawings. Oiltight JIC wireway shall be installed to provide a watertight installation. All field cuts shall be made with a hacksaw. Efcor "Water-Tite" rigid conduit hubs, or acceptable equal, shall be used to connect conduit to oiltight wireway.

16D.8 UNDERGROUND DUCT BANK CONSTRUCTION. Concrete encased duct banks of individually assembled plastic duct, arranged as indicated on the drawings, shall be furnished and installed in accordance with the following specification.

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16D.8.1 Excavation. All excavation work shall conform to Section 2A.

16D.8.2 Concrete. All concrete work shall conform to Section 3A.

16D.8.3 Manholes. Manholes shall be as indicated on the drawings.

16D.8.4 Material. Underground duct system materials furnished under these specifications shall be new and undamaged and shall conform to the following requirements.

Duct	Polyvinyl chloride, Type EB in 20 foot sections, in accordance with NEMA TC-6
Couplings	Polyvinyl chloride, for use with above duct
Spacers	Plastic high impact, interlocking, base and intermediate type
End bells	Plastic
Plugs	Plastic, high impact, tapered to fit end bell provided
Duct binder	Hemp or sisal twine
Riser termination couplings	Rigid hot-dip galvanized mild steel
Riser bends	Polyvinyl chloride, Type EB, in accordance with NEMA TC-6, factory made, 36 inch minimum radius, 90 degree, entirely concrete encased
Manhole materials	Shall be as specified and indicated on the drawings

16D.8.5 Duct Bank Installation. Each duct bank shall be laid to exact grade in the trench and the ends shall enter manholes or buildings as indicated on the drawings. No dips or low points which retain water in any duct will be permitted in ducts between manholes or between buildings and manholes. End bells shall be used on individual ducts at the end of duct banks entering manholes or buildings except where another type of termination is specified or detailed on the drawings. All sweeps shall be fabricated with straight sections of duct, bent to provide the radius indicated on the drawings.

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The ends of the individual ducts shall be cleaned and swabbed with joint sealing compound, and the duct shall then be forced tightly into the coupling to make a watertight connection. The individual ducts shall be laid in place, held by standard spacers placed at 5 foot intervals, and bound with hemp or sisal twine. The ends of the ducts in each of the upper layers shall be stepped back approximately 2 feet from the end of the layer immediately below it. The concrete envelope shall be poured at least 24 hours after the individual ducts are securely tied in place and adequately anchored and/or weighted to completely counteract the buoyancy of the ducts in the fluid concrete. Care shall be taken in pouring the concrete to prevent the empty ducts from being damaged or displaced, either in grade or alignment.

Defective ducts shall not be installed and shall be removed immediately from the site of the work. Particular care shall be taken to keep concrete or other substances from the inside of the individual ducts during construction. All reinforcing materials and other magnetic materials installed in a duct bank shall be parallel to the lengths of the individual ducts, except for ties enclosing all ducts of the duct bank.

All risers shall be terminated with a PVC flush coupling or end bell and plugged as indicated on the drawings.

16D.8.6 Testing and Cleaning. After completion of the duct bank or before cable is pulled into existing duct banks, each duct shall be tested and cleaned, and ducts which will not be used immediately shall be plugged at each end. As a clearance test, each duct shall pass a mandrel with a diameter 1/4 inch less than the inside diameter of the duct. All foreign material, earth, sand, and gravel shall be removed from the ducts with circular stiff bristled brushes. A 1/4 inch nylon rope shall be installed in all unused ducts.

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Section 16E - CONDUCTORS

16E.1 GENERAL. This section covers the installation of the cable and conductors described in Section 16A, and the furnishing and installation of the cable specified on the Cable Specification sheets included at the end of this section. All insulated cable, conductors, and conductor accessories not specifically stated as being Owner-furnished but which are required for a complete installation as indicated on the drawings, and in these specifications shall be furnished and installed in accordance with this section of these specifications.

Cable reels shall be stored and handled in a manner which will prevent physical damage to the cable. Cable reels shall be stored on a hard surface to prevent contact between cable insulation and earth due to sinking of the reel. Impact damage between reels shall be prevented by aligning reels flange to flange or by using guards across flanges. During storage, the ends of all cable rated 5 kV and above shall be protected with end caps.

All cable and conductor accessories furnished by the Contractor shall be approved by the Site Construction Manager prior to purchase.

16E.1.1 Circuit Information. Information necessary for the installation of circuits will be provided by the Site Construction Manager.

16E.2 CABLE SPECIFICATIONS. The cable furnished shall conform to the Cable Specification sheets included at the end of this section.

The term "Type" used on the drawings and in these specifications refers to the letter identification indicated in the upper right corner of each Cable Specification sheet.

16E.2.1 Cable Manufacturers. The cable furnished shall be produced by one or more of the manufacturers indicated in the following tables or by the manufacturers indicated on the Cable Specification sheets. Each "X" in the tables indicates an acceptable manufacturer of the indicated cable.

NONFLAME RETARDANT CABLE

	<u>Power Cable 5 kV & Above</u>	<u>Ltg & 600 V Power Cable</u>	<u>Control Cable</u>	<u>Instru Cable</u>	<u>Thermo- couple Exten Cable</u>	<u>High Temp Cable</u>
BIW Cable Systems, Inc.		X	X	X	X	
Brand-Rex Co.			X	X	X	

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	<u>Power Cable 5 kV & Above</u>	<u>Ltg & 600 V Power Cable</u>	<u>Control Cable</u>	<u>Instru Cable</u>	<u>Thermo- couple Exten Cable</u>	<u>High Temp Cable</u>
Cablec Corp. (Anaconda & Phelps Dodge)	X	X	X			
Collyer Insulated Wire		X	X	X		X
Eaton Corp., Process Control Components Division			X	X	X	
The Okonite Co.	X	X	X	X	X	X
Pirelli Cable Corp.	X	X	X			
The Rockbestos Co.		X	X	X	X	X
Roma Cable Corp.	X	X	X	X		
Thermo Electric				X	X	X

FLAME RETARDANT CABLE

	<u>Power Cable 5 kV & Above</u>	<u>Ltg & 600 V Power Cable</u>	<u>Control Cable</u>	<u>Instru Cable</u>	<u>Thermo- couple Exten Cable</u>	<u>High Temp Cable</u>
BIW Cable Systems, Inc.		X	X	X	X	X
Brand-Rex Co.			X	X	X	
Cablec Corp. (Anaconda)	X	X	X			
Collyer Insulated Wire		X	X	X		X
Continental Wire and Cable			X	X	X	X

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	<u>Power Cable 5 kV & Above</u>	<u>Ltg & 600 V Power Cable</u>	<u>Control Cable</u>	<u>Instru Cable</u>	<u>Thermo- couple Exten Cable</u>	<u>High Temp Cable</u>
Eaton Corp., Process Control Components Division			X	X	X	X
FL Industries Inc. Surprenant Division		X	X	X	X	X
The Okonite Co.	X	X	X	X	X	X
Pirelli Cable Corp.	X	X	X			
The Rockbestos Co.		X	X	X	X	X
Rome Cable Corp.	X	X	X	X		

16E.3 CONDUCTOR ACCESSORIES. All conductor accessories including connectors, terminations, insulating materials, support grips, markers, and cable ties shall be furnished and installed.

Supplier's installation instructions shall be obtained for cable accessories. These instructions shall be in the possession of the craftsmen while installing the accessories and shall be available to the Site Construction Manager for reference.

16E.3.1 Terminal Connectors for Conductors 6 AWG and Larger. Terminal connectors for conductors 6 AWG and larger shall be pressure or bolted clamp type, Burndy Qiklug, Varilug, or acceptable equal; or compression type, Burndy Type YAV or YA (long barrel), Panduit Type LCA or LCC, or acceptable equal. Acceptable connectors included with Owner-furnished equipment may be used.

16E.3.2 Terminal Connectors for Conductors Smaller than 6 AWG. Terminal connectors for conductors smaller than 6 AWG shall be compression type connectors properly sized for the conductor and the terminal. The connectors shall be constructed of fine grade high conductivity copper in accordance with QQ-C-576 and shall be tin plated in accordance with MIL-T-10727. The interior surface of the connector wire barrel shall be serrated, and the exterior surface of the connector wire barrel shall be provided with crimp guides.

Noninsulated terminal connectors shall be provided on conductors terminated on devices equipped with individual fitted covers, such as General Electric Type SB-1 control switches and General Electric Type HEA lockout relays. All other terminal connectors for conductors smaller than 6 AWG shall be preinsulated ring type.

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Preinsulated terminal connectors shall include a vinyl insulating sleeve, color coded to indicate conductor size. Preinsulated terminal connectors for conductors 10 AWG and smaller shall include a metallic support sleeve bonded to the vinyl insulating sleeve and designed to grip the conductor insulation.

Ring type connectors shall be rated 600 volts and shall be manufactured by AMP, 3M, Panduit, or acceptable equal.

Terminal connectors for Type R cable shall be Jerrold F-11 cable connectors.

Terminal connectors for Type UA cable shall be Jerrold F-56 cable connectors.

Terminal connectors for Type UF cable shall be AMP No. 227285-2.

16E.3.3 Terminal Blocks. Terminal blocks for conductors rated 600 volts or less shall be strap screw type, rated 600 volts, shall have 25 percent more terminal points than the quantity of conductors requiring termination, and shall have white marking strips. Terminal blocks shall be sized for the conductor being terminated except that terminal blocks for all conductors 10 AWG and smaller shall be Marathon 1500 Series or acceptable equal.

16E.3.4 Splicing Connectors. Splices in power, control, and instrument conductors shall be with compression type connectors. Splices in lighting conductors smaller than 8 AWG shall be with 3M Company "Scotchlok" twist type insulated spring connectors, Panduit JN wire joints, or acceptable equal. Splices in lighting conductors 8 AWG and larger shall be with compression type connectors. Splicing connectors for cable Types I, R, and Y shall be as specified on the drawings.

16E.3.5 Crimping Tools. Crimping tools used to secure conductors in compression type connectors or terminal lugs shall be those made for that purpose and for the conductor sizes involved. The crimping tools shall accurately crimp the connector barrel and shall accurately crimp the conductor insulation support sleeve where provided. Crimping tools shall be provided with guides to position connectors in the tool, shall be provided with stops to prevent overcrimping, and shall be of a type which prevents the tools from opening until the crimp action is completed. Crimping tools shall be a product of the connector manufacturer or shall be as recommended by the connector manufacturer and acceptable to the Site Construction Manager for use with the connectors. The Contractor shall establish and maintain a tool certification program to ensure that crimping tools are kept in accurate operating condition.

16E.3.6 Insulating Materials. Insulating materials for splice and termination insulation shall be in accordance with the following.

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16E.3.6.1 600 Volt Cable. Insulating materials for terminal connectors or compression type splicing connectors Raychem Type MCK Series 600 volt motor connection kits or acceptable equal, or shall consist of varnished cambric tape, rubber tape, and vinyl tape. Taping materials shall be as listed below or acceptable equal.

Varnished Cambric Tape - 3M Company Irvington 2520
Rubber Tape - 3M Company Scotch 130C
Vinyl Tape - 3M Company Scotch 33+

16E.3.6.2 Shielded Cable Rated 5 kV and Above. Insulating materials for terminal connectors in motor terminal housings shall be Raychem Type MCK-5 high voltage motor connection kits or acceptable equal.

Connections to insulated switchgear buses shall be insulated with removable boots furnished with the switchgear or acceptable equal.

Other indoor terminal connectors, including those located in air insulated terminal chambers, shall be insulated using Raychem Type HVBC high voltage bus connection kits or be insulated by utilizing a taped system. Taping materials shall be as listed below or acceptable equal.

Copper Braid Tape - 3M Company Scotch 24
Rubber Tape - 3M Company Scotch 130C
Vinyl Tape - 3M Company Scotch 33+

Splicing connectors for 5 kV and 15 kV cable shall be insulated using 3M Company 5400 Series or 5500 Series Quick-Splice Inline Splicing Kits, Raychem Type HVS splicing kits, or acceptable equal.

16E.3.6.3 Coaxial and Other Special Purpose Cables. Insulating materials for cable Types R, Y, and I shall be as specified on the drawings.

16E.3.6.4 Fiber-Optic Cable. Insulating materials for terminating Type UF cable shall consist of Belden Break Out Kit No. 229762.

16E.3.7 Support Grips. Cable support grips shall be either split or closed woven wire type as manufactured by The Kellems Division, Harvey Hubbell Incorporated, Stonington, Connecticut.

16E.3.8 Wire and Cable Markers. Markers for wire and cable circuits shall be of an opaque nylon material arranged to include a marker board, nonreleasing holding device, and cable fastening tail. The marker board shall not be less than 3/4 inch wide, 2-1/2 inches long, and 25 mils thick and shall be Panduit Corp. Part No. MP250 marker plates or acceptable equal. One side shall be roughened to hold black nylon marking ink

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from a pen similar to Thomas & Betts Company "TY-RAP" marking pen, Catalog No. WT163M-1, or Panduit Corp. Part No. PX marking pen. Identification shall be permanent and waterproof. The holding device shall be designed to allow the fastening tail to pass around the cable through the holding device and prevent the removal of the tail without cutting it loose from the marker.

16E.3.9 Cable Ties. Lacing materials for field installed cable shall be nonreleasing weather-resistant black nylon ties manufactured by Thomas & Betts Company, Elizabeth, New Jersey; Panduit Corp., Tinley Park, Illinois; 3M Company; or acceptable equal.

16E.3.10 Cable Termination Kits for Shielded Cable Rated 5 kV and Above. All cable termination kits for shielded cable rated 5 kV and above shall be in accordance with the requirements of IEEE 48 for Class 1 terminations.

Cable termination kits for 5 kV and 15 kV shielded cable in motor terminal housings shall be Raychem Type HVT-I termination kits or acceptable equal.

Except for terminations at motors, indoor cable termination kits (which include kits for terminations located in air insulated terminal chambers) for 5 kV and 15 kV shielded cable shall be 3M Company Quick-Term molded rubber termination kits which include stress cones and insulators, Raychem Type HVT-I termination kits, or acceptable equal.

Cable termination kits for outdoor 2.4 kV distribution riser 5 kV shielded cable terminations shall be Joslyn "Easy-On II" E5200 Series Catalog No. E5200-BL-025S-TTG-C and sized for the 250 Mcm 5 kV cable furnished.

Cable termination materials for 2,400 volt pad mounted transformer primaries shall consist of one each of the following per phase, or acceptable equal.

Deadbreak elbow, RTE Catalog No. 2604360B--M suitable for 250 Mcm Type X cable

Tape shield adapter, RTE Catalog No. 2625133B07M. Required only if Type X cable is furnished with a metallic tape shield

Surge arrester, 3 kV, RTE Catalog No. 3237015C03M

16E.4 INSTALLATION. Conductor installation shall be in accordance with the cable manufacturer's recommendations and the articles which follow.

16E.4.1 Cable Placement. All cable shall be routed as indicated on the drawings.

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Cable shall not be handled when the cable temperature is below the minimum temperature recommended by the manufacturer. If cable heating is required prior to placement, the cable shall be stored in a heated building in accordance with the manufacturer's recommendations for at least 24 hours. Cable shall be placed the same day it is removed from heated storage.

If at any time during the progress of the work the Contractor finds raceways which appear inadequate to accommodate the assigned cable, he shall notify the Site Construction Manager at once and shall discontinue any further work on the questionable raceway until advised by the Site Construction Manager as to how he shall proceed.

Immediately prior to the placement of each cable or cable group, the raceway route to be followed shall be inspected and ascertained to be complete in installation and free of all materials detrimental to the cable or its placement. All cable assigned to a particular duct or conduit shall be grouped and pulled in simultaneously using cable grips and acceptable lubricants.

All cable shall be carefully checked both as to size and length before being pulled into conduits or ducts. Cable pulled into the wrong conduit or duct or cut too short to rack, train, and splice as specified herein shall be removed and replaced by and at the expense of the Contractor. Cable removed from one conduit or duct shall not be pulled into another conduit or duct.

16E.4.1.1 Cable in Trays. All cable shall be carefully laid in or pulled through the tray system so that neither the cable nor the trays are damaged. Cable may be laid along the side of the tray system during placement provided it is protected from dirt, water, oil, or other detrimental materials and from mechanical injury. Cable shall be cut sufficiently long to conform to the contour of the trays; with particular attention paid to vertical inside bends. All excessive slack shall be removed from the cable so that it lies parallel to the sides of the trays. Multiple single conductor cable which constitutes a single power circuit shall be grouped together to minimize magnetic influence on other cable in the area. The cable shall be tied to the trays with nylon ties at 10 foot intervals to hold it in place. Cable clamps designed for holding the cable inside the trays shall be installed at all vertical bends.

16E.4.1.2 Cable in Manholes. Cable shall be supported at all times without short bends or excessive sags and shall not be permitted to lie on the manhole floor. Cable ends must not be submerged. Cable racks or trays shall be provided for permanent support. Temporary support required during placement shall be with rope slings, timbers, or alternate method acceptable to the Site Construction Manager.

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16E.4.1.3 Cable Pulling. Fishing and pulling shall be done with flexible round metal tape, CO₂ propelled polyethylene cord, nylon rope, or manila rope.

Unless specified otherwise or acceptable to the Site Construction Manager, cable shall not be pulled in a single pull through two sections of designed raceway connected by a manhole or pull box. Cable shall be pulled out at each manhole and pull box to the length required for termination. Prior to repulling of the pulled out cable, the cable shall be thoroughly inspected, cleaned, and relubricated. Damaged cable shall be removed and replaced by and at the expense of the Contractor.

Cable may be pulled in a single pull through two sections of designed raceway connected by a manhole or pull box only if it can be determined by calculation to the satisfaction of the Site Construction Manager that the pulling tension will not exceed the maximum tension allowed by the cable manufacturer.

16E.4.1.4 Cable Grips. Woven wire cable grips shall be used to pull all single conductor cable 2/0 AWG and larger and all multi-conductor cable. Pulling loops shall be used to pull single conductor cable smaller than 2/0 AWG. All sharp points and edges on the hardware attaching the pulling rope to the cable shall be taped to prevent snagging or damaging the raceway.

When a cable grip is used for pulling, the area of the cable covered by the grip or seal plus 6 inches shall be cut off and discarded when the pull is completed. When pulling loops are used, the entire loop shall be cut off and discarded when the pull is completed.

As soon as the cable is pulled into place, the cable grips or pulling loops shall be removed and any cable which was sealed shall be resealed.

16E.4.1.5 Swivels. A reliable nonfreezing type of swivel, or swivel connection, shall be inserted between the pulling rope and the cable pulling eye, grip, or loop to prevent twisting under strain.

16E.4.1.6 Pulling Lubricants. Only lubricants recommended by the cable manufacturer and acceptable to the Site Construction Manager shall be used. Lubricants shall be applied liberally and continuously during the pull.

16E.4.1.7 Inspection. The outside of each cable reel shall be carefully inspected and protruding nails, fastenings, or other objects which might damage the cable shall be removed. A thorough visual inspection for flaws, breaks, or abrasions in the cable sheath shall be made as the cable leaves the reel, and the pulling speed shall be slow enough to permit this inspection. Damage to the sheath or finish of the cable shall

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be sufficient cause for rejecting the cable. Cable damaged in any way during installation shall be replaced by and at the expense of the Contractor.

16E.4.1.8 Pulling Tension. The pulling tension of any cable shall not exceed the maximum tension recommended by the cable manufacturer. Pulling mechanisms of both the manual and power types used by the Contractor shall have the rated capacity in tons clearly marked on the mechanism. Whenever the capacity of the pulling mechanism exceeds the recommended pulling tension of the cable as given by the cable manufacturer, a dynamometer shall be used to show the tension on the cable and the indicator shall be constantly watched. If any excessive strain develops, the pulling operation shall be stopped at once and the difficulty determined and corrected.

16E.4.1.9 Sidewall Pressure. To avoid insulation damage from excessive sidewall pressure at bends, the pulling tension in pounds at a bend shall not exceed 300 times the radius of the bend in feet.

16E.4.1.10 Cable Bends. Tape shielded and cables with aluminum moisture barriers shall not be bent to a radius of less than 12 times the overall cable diameter. All other cables shall not be bent to a radius of less than eight times the cable diameter.

16E.4.1.11 Supports. All cable supports and securing devices shall have bearing surfaces located parallel to the surfaces of the cable sheath and shall be installed to provide adequate support without deformation of the cable jackets or insulation.

Adequate cable end lengths shall be provided and properly placed in junction boxes and manholes to avoid longitudinal strains and distorting pressures on the cable at conduit bushings and duct end bells.

Final inspection shall be made after all cable is in place and, where supports, bushings, and end bells deform the cable jacket, additional supports shall be provided as directed by the Site Construction Manager. Additional cable protection such as a wrapping of light rubber belting, friction tape, or similar material shall be provided where required.

Cable in vertical runs shall be supported by woven wire grips in accordance with the NEC requirements, except that the distance between supports shall conform to the following.

<u>Conductor Size</u>	<u>Vertical Cable Support Spacing</u>
1/0 AWG and smaller	100 feet
2/0 AWG thru 500 Mcm	50 feet
Larger than 500 Mcm	30 feet

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Flexible cable furnished with equipment which is designed for in-service motion, such as vibratory feeders, shall be supported by woven wire grips at the non-factory-terminated end.

16E.4.1.12 Cable Racks. Cable racks shall be furnished and installed according to the drawings and as required to provide the proper cable support. Cable racks shall be installed on spacings of not greater than 36 inches and shall be bolt secured to permanent wall surfaces with continuous slot concrete inserts.

16E.4.1.13 Spare Conductors. All spare conductors of a multi-conductor cable shall be left at their maximum lengths for possible replacement of any other conductors in the cable. Each spare conductor shall be neatly coiled and then taped to the conductors being used.

16E.4.1.14 Lacing. Nylon ties shall be used to neatly lace together conductors entering switchboards and similar locations after the conductors have emerged from their supporting raceway and before they are attached to terminals.

16E.4.1.15 Cable Identification. The Contractor shall identify the ends of all circuits installed under this Contract. The Contractor shall also identify all circuits in manholes, handholes, and pull boxes.

At terminations, the Contractor shall identify each conductor of power circuits, each multi-conductor cable, and each conductor of circuits consisting of multiple single conductors where the conductors are not otherwise identified. Each cable marker shall bear the number of the corresponding circuit according to the drawings. Markers shall be attached where the first individual conductor is routed away from the assembly. Each phase of multiphase power circuits shall be individually identified.

In manholes, handholes, and pull boxes, each circuit shall be identified. Each marker shall bear the number of the circuit according to the drawings.

One end of each marker board shall remain free of the fastening tail, and the entire marker shall be so attached that it is readily visible for circuit identification.

16E.4.1.16 5 kV and Above Cable Moisture Seals. Each cable rated 5,000 volts and above shall be kept sealed except when termination and splicing work is being performed.

The ends of all cables shall be sealed with heat shrinkable caps. Cap sizes shall be as recommended by the cap manufacturer for the cable OD and insulation. Caps shall contain sufficient adhesive that shrinkage of the cap during application results in formation of a positive watertight seal capable of withstanding complete immersion or total exposure without permitting the entrance of moisture. Heat shrinkable caps shall be "Thermofit" as manufactured by Raychem Corporation or acceptable equal.

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Before and after pulling, the leading end seal of each length of cable shall be examined and repaired if necessary. All cut cable ends shall be promptly sealed after cutting except those to be spliced or terminated immediately.

16E.4.1.17 Control Wiring Jumpers. The Contractor shall install all control wiring jumpers indicated on the drawings with the exception of jumpers which have been previously installed. The Contractor shall be responsible for determining which jumpers are existing and shall not duplicate any existing jumpers.

Jumpers shall be made using either individual undamaged conductors from Owner-furnished multi-conductor 12 AWG or 14 AWG control cable or Contractor-furnished Type S 14 AWG cable. Specific size conductors shall be used where indicated on the drawings.

Jumpers shall not be installed in wiring gutters except where acceptable to the Site Construction Manager or where length exceeds 2 feet and a wiring gutter is furnished. The use of differently color coded single conductors obtained from Owner-furnished multi-conductor control cables is preferred for jumpers. Where jumper length exceeds 2 feet or where an individual jumper's electrical path and terminations are not clearly visible, the Contractor shall furnish and install opposite end designation wire markers. The Contractor shall exercise extreme care to ensure that jumpers are installed on the proper side of each sliding link terminal block. Jumpers which are improperly installed shall be replaced at no cost to the Owner.

16E.4.1.18 Control Conductor Color Code Modification. Where indicated on the drawings, the Contractor shall furnish and install white tape on control insulated conductors to indicate neutral and green tape on control insulated conductors to indicate ground. Tape shall be Scotch Type 35 or acceptable equal and shall be installed so that the insulated conductor appears striped starting at the terminal for a minimum of 3 inches.

16E.4.2 Splices. No splices shall be made in conductors for instrument circuits or control circuits without specific acceptance by the Site Construction Manager except where required at connections to accessory devices equipped with factory installed pigtails or where high temperature wire is necessary locally to connect to a particular device or where indicated on the drawings. Shields may be spliced where necessary to permit connection to the station ground.

Power cable circuits may be spliced only by methods and at locations acceptable to the Site Construction Manager.

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Splices shall not be made to utilize short lengths of cable nor shall they be made to provide correct lengths on cable initially cut too short for a particular circuit.

Splices will not be permitted on Type UF cable. This cable shall be furnished in length sufficient to provide a continuous cable for each circuit.

Splices, joints, and connections in cable shall be made only in pull boxes, junction boxes, or manholes unless otherwise indicated on the drawings and shall be made in accordance with the instructions of the cable manufacturer. Splices on Type I, R, and Y cable shall be made in accordance with the drawings.

Splices in cable shall be prepared and insulated in a manner similar to the cable terminations specified below.

16E.4.3 Splitters and Taps for Coaxial Cable. Splitters and taps shall be mounted on insulating baseplates to maintain shield isolation with local ground. Mounting shall be such that sufficient space remains for training and terminating Owner-furnished and Contractor-furnished coaxial cables.

Where Owner-furnished Type R coaxial cable terminates on two or more ports of either a splitter or tap, or where two or more Type R cables enter an I/O cabinet, the outer braid shield shall be made electrically continuous. The Type R cable shall be prepared as on the drawings, and Jerrold F-11 connectors installed. Stainless steel hose clamps shall be used to secure a 12 AWG Type TW ground conductor to the exposed outer braid of each coaxial cable to complete the electrical connection of the braids across the splitter or tap. Two half-lapped layers of Scotch 33+ vinyl tape shall be applied over the hose clamps and any exposed braid shield to retain isolation of the second braid shield with local ground.

16E.4.4 Terminations. Cable shall be terminated in accordance with the following requirements.

Train cable in place and cut squarely to required length.
Avoid sharp bends.

Remove necessary amount of cable jacket and insulation without damage to the conductor. Follow instructions on the drawings for preparation of cable Types I, R, and Y.

Install terminals or terminal connectors as required, ensuring a firm metal-to-metal contact.

Install cable termination kits using the procedures recommended by the manufacturer of the kit being used.

[IPP 9255 CONST MOD SERVICES 71.0603]
[040987]
16E-12

Install high voltage cable termination kits for shielded cable rated 5 kV and above using the procedures recommended by the manufacturer of the kit being used.

Insulate each connection of cable to an insulated conductor (whether cable, bus, or equipment bushing). The insulation shall cover all exposed surfaces of the conductors; the insulation voltage level of the completed termination shall be not less than the system voltage level of the connected conductors. Insulation of connections shall be as specified in the following articles.

16E.4.4.1 Insulation of 600 Volt Cable Connections. Where connections of cable rated 600 volts or less require insulation, the connections shall be insulated using connection kits or shall be taped in accordance with the following.

A minimum of four half-lapped layers of rubber tape, elongated not more than 20 percent

A minimum of three half-lapped layers of vinyl tape applied over the rubber tape. The vinyl tape shall extend a minimum of two cable diameters over the cable jacket and a similar distance over the insulation of the conductor to which the cable is connected.

16E.4.4.2 Insulation of Connections on Indoor Shielded Cable Rated 5 kV and Above. Where indoor connections of shielded cable rated 5 kV and above require insulation, the connections shall be insulated using removable boots or connection kits or shall be taped in accordance with the following.

All exposed conductor and connector surfaces shall be covered with one half-lapped layer of copper braid tape.

Half-lapped layers of rubber tape, elongated not more than 20 percent, shall be applied over the copper tape. The number of layers of this tape shall be in accordance with the following.

<u>Line-to-Line Operating Voltage of Equipment</u>	<u>Number of Half-Lapped Layers of Rubber Tape Required</u>
2,400	4
4,160	5
6,900	7
13,800	10

[IPP 9255 CONST MOD SERVICES 71.0603]
[040987]
16E-13

IP7011955

Two half-lapped layers of vinyl tape shall be applied over the rubber tape. The tape shall extend a minimum of two cable diameters over the cable jacket and a similar distance over the insulation of the conductor to which the cable is connected.

16E.4.4.3 Sensing Element Cable Terminations. Sensing element cable terminations for Contractor-furnished cable Types UB and UC shall be made using Drexelbrook cable termination kit No. 389-1-6. Drexelbrook cable terminating tool No. 290-1-3 shall be used where indicated in the instructions included in the termination kit. Drexelbrook cable, termination kits, and installation tools are available from the following source.

Drexelbrook Engineering Co.
205 Kaith Valley Rd.
Horsham, Pennsylvania 19044
(215) 674-1234

16E.4.4.4 Fiber-Optic Cable Terminations. Cable Type UF shall be terminated in accordance with the instructions included with the break out kit and connector kits. All spare fibers shall be left at their maximum length, terminated identically to those being used, and then coiled and taped aside for later use. A protective cap shall be placed over all connectors not yet coupled to equipment.

16E.4.5 Tests After Placement. All insulated conductors shall be electrically tested after placement.

All circuits, including lighting circuits, shall be tested with the circuit complete except for connections to equipment. All splices, stress cones on shielded cable, and terminal connector attachments shall be complete prior to testing.

In addition to the tests performed after cable placement is complete, continuity tests and insulation tests shall be performed on all supervisory and communication cable before and after each splice is made.

Any circuit failing to test satisfactorily shall be replaced or repaired and then retested.

All equipment and labor required for testing shall be furnished by the Contractor.

16E.4.5.1 Continuity and Identification Tests. All insulated conductors shall be tested for continuity and conductor identification.

16E.4.5.1.1 Continuity Tests. Continuity tests shall include all tests necessary to confirm that each conductor is continuous throughout its entire length.

[IPF 9255 CONST MOD SERVICES 71.0603]
[040987]
16E-14

IP7011956

16E.4.5.1.2 Identification Tests. Identification tests shall include all tests necessary to confirm that the conductor being investigated originates and terminates at the locations designated on the drawings.

16E.4.5.2 Insulation Tests. Resistance from ground provided by the insulation on all field installed insulated conductors shall be measured. Measurement shall be accomplished as described in the following articles.

16E.4.5.2.1 Cable Rated 5,000 Volts and Above. All conductors with insulation rated 5,000 volts and above shall be given a field voltage test.

The ampacity of direct current testing equipment shall be not less than 2,500 microamperes.

Application of test voltage shall be as specified on the Cable Test Data form included at the end of this section. Final test voltage and the duration of the test shall be as indicated on the Cable Specification sheet for the cable under test.

The tests shall be performed by competent personnel specializing in electrical cable testing. Cable test data on each cable tested shall be reported to the Site Construction Manager in triplicate on Cable Test Data forms provided by the Site Construction Manager.

16E.4.5.2.2 Cable Rated Below 5,000 Volts. All circuits containing 10 AWG or larger insulated conductors which the Contractor has installed shall be tested with a 1,000 volt megger or an equivalent testing device. Insulation resistance measurements shall be made between each conductor and ground and between each conductor and all other conductors of the same circuit. Minimum acceptable resistance values shall be approximately 500 megohms.

[IPP 9255 CONST MOD SERVICES 71.0603]
[040987]
16E-15

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-93-693/NEMA WC74

CONDUCTOR: CONCENTRIC-LAY COATED COPPER; STRAND CLASS B; NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: ETHYLENE-PROPYLENE RUBBER. ICEA S-93-693, PART 3.

SHIELD: NONE.

JACKET: CHLOROSULFONATED POLYETHYLENE, ICEA S-93-693

FACTORY TESTS: IN ADDITION TO THE REQUIREMENTS OF ICEA S-93-693, FINISHED CABLES SHALL MEET THE VERTICAL TRAY FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS-BURNER FLAME SOURCE.

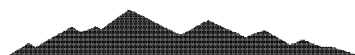
CABLE DETAILS

CONDUCTOR		* THICKNESS (INCHES)		
SIZE (AWG OR MCM)	NO. OF STRANDS	CONDUCTOR INSULATION	JACKET	O.D. MAX (INCHES)
14	7	.030	.015	.20
12	7	.030	.015	.22
10	7	.030	.015	.24
8	7	.045	.015	.31
6	7	.045	.030	.38
4	7	.045	.030	.43
2	7	.045	.030	.49
1	19	.055	.045	.57
1/0	19	.055	.045	.62
2/0	19	.055	.045	.66
4/0	19	.055	.045	.77
250	37	.065	.065	.88
350	37	.065	.065	.99
500	37	.065	.065	1.13
750	61	.080	.065	1.35
1000	61	.080	.065	1.50

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 90 PERCENT (INSULATION) AND 80 PERCENT (JACKET) OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, AND VOLTAGE CLASS.


IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-1-FR-EPR-CSP

CABLE SPECIFICATION

600 VOLT FRAME RETARDANT MULTICONDUCTOR NO. 12 AWG CONTROL AND POWER CABLE		TYPE <u> E </u> SPEC <u> </u> PROJECT <u> </u>																																				
STANDARD SPECIFICATIONS REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202. CONDUCTOR: 12 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C. INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658/NEMA WC 70, NOT LESS THAN 30 MILS AVERAGE THICKNESS (27 MILS MINIMUM THICKNESS). SHIELD: NONE. JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-66-524, PARAGRAPH 7.3.7.3, ASSEMBLY JACKET APPLIED OVER TAPE WRAPPED CABLE CORE. CONDUCTOR IDENTIFICATION: ICEA S-66-524, APPENDIX L, METHOD 1, COLORED COMPOUNDS WITH TRACERS, TABLE L-2. WHITE OR GREEN CONDUCTORS SHALL NOT BE PROVIDED. FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658/NEMA WC 70, PARAGRAPH 7.7.9. THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7-32. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.																																						
CABLE DETAILS <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">NUMBER OF CONDUCTORS</th> <th style="text-align: center;">*ASSEMBLY JACKET THICKNESS (INCHES)</th> <th style="text-align: center;">O.D. MAX (INCHES)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">2</td><td style="text-align: center;">0.045</td><td style="text-align: center;">.47</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">0.045</td><td style="text-align: center;">.50</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">0.045</td><td style="text-align: center;">.54</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.62</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.66</td></tr> <tr><td style="text-align: center;">14</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.66</td></tr> <tr><td style="text-align: center;">8</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.71</td></tr> <tr><td style="text-align: center;">14</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.77</td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.82</td></tr> <tr><td style="text-align: center;">12</td><td style="text-align: center;">0.060</td><td style="text-align: center;">.86</td></tr> <tr><td style="text-align: center;">15</td><td style="text-align: center;">0.080</td><td style="text-align: center;">.99</td></tr> </tbody> </table> <p style="margin-top: 10px;">* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.</p> <p>A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.</p>			NUMBER OF CONDUCTORS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)	2	0.045	.47	3	0.045	.50	4	0.045	.54	5	0.060	.62	6	0.060	.66	14	0.060	.66	8	0.060	.71	14	0.060	.77	10	0.060	.82	12	0.060	.86	15	0.080	.99
NUMBER OF CONDUCTORS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)																																				
2	0.045	.47																																				
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15	0.080	.99																																				
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600 VOLT

SINGLE
CONDUCTORHIGH TEMPERATURE AND
LIGHTING FIXTURE CABLETYPE HT
SPEC _____
PROJECT _____**STANDARD SPECIFICATIONS**

REFERENCE: UL 62, UL 83.

CONDUCTOR: CONCENTRIC-LAY, COATED COPPER.

INSULATION: SILICONE RUBBER UL 62, CLASS 22, NORMAL MAXIMUM OPERATING TEMPERATURE 200° C.

SHIELD: NONE.

JACKET: GLASS BRAID, UL 83, NOT LESS THAN 0.006 INCH THICK.

CONDUCTOR IDENTIFICATION: WHITE BRAID OR BLACK BRAID.

FACTORY TESTS: CABLE SHALL MEET THE REQUIREMENTS OF UL 62, CLASS 22, AND THE REQUIREMENTS OF UL 83 FOR GLASS BRAIDS.

CABLE DETAILS**CONDUCTOR**

SIZE (AWG)	NO. OF STRANDS	THICKNESS (INCHES)	**CONDUCTOR INSULATION (INCHES)	UL TYPE DESIGNATION	MAX (INCHES)	O.D. (INCHES)
18	7	0.030		SF-2		.14
16	7	0.030		SF-2		.15
14	7	0.030		SF-2		.17
12*	19	0.030		SIMILAR TO SF-2		.19
10*	19 OR 41	0.045		SIMILAR TO SF-2		.25

* CONDUCTOR SIZE NOT COVERED IN UL 62.

** THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 90 PERCENT OF THE VALUES INDICATED ABOVE.

BRAID COLOR SHALL BE IN ACCORDANCE WITH NEC AND AS INDICATED ON THE DRAWINGS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-1-SR-SF2-HT-FIX

CABLE SPECIFICATION

IP7011960

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTORS: TWO 16 AWG, 7 STRAND CONCENTRIC-LAY, ONE UNCOATED COPPER AND ONE TIN COATED COPPER.

CONDUCTOR INSULATION: RADIATION CROSS-LINKED POLYETHYLENE, ICEA S-95-658/NEMA WC 70, PARAGRAPH 3.6, 45 MILS AVERAGE THICKNESS ON EACH CONDUCTOR.

LAY: TWISTED CONDUCTORS WITH 2-1/2 INCH NOMINAL LAY.

BELT INSULATION: RADIATION CROSS-LINKED POLYETHYLENE, ICEA S-95/658/NEMA WC 70, PARAGRAPH 3.6, 25 MILS AVERAGE THICKNESS, BELT INSULATION DIAMETER. 355 INCH NOMINAL.

SHIELD: 33 AWG TIN COATED COPPER BRAID, 95 PERCENT MINIMUM COVERAGE..

FIRST JACKET: FLAME RETARDANT RADIATION CROSS-LINKED POLYETHYLENE, ICEA S-95-658/NEMA WC 70, PARAGRAPH 7.7.3.1, 40 MILS AVERAGE THICKNESS, JACKET DIAMETER .465 INCH NOMINAL.

MOISTURE BARRIER: DEAD SOFT ALUMINUM CONDUCTOR ASSEMBLY TAPE, 8 MILS NOMINAL THICKNESS WITH 2 MILS NOMINAL THICKNESS ETHYLENE COPOLYMER ADHESIVE COATING ON BOTH SIDES. COATED SURFACES SHALL BOND TO EACH OTHER AND TO THE OUTER JACKET IN A LONGITUDINAL SEAM. THE TAPE SHALL HAVE A MINIMUM OVERLAP OF 1/8 INCH. THE AVERAGE SEAL STRENGTH OF THE OVERLAP AND THE AVERAGE BOND STRENGTH OF THE OUTER JACKET TO TAPE SHALL BE 8 POUNDS PER INCH OF LENGTH (4 POUNDS MINIMUM).

OUTER JACKET: FLAME RETARDANT RADIATION CROSS-LINKED POLYOLEFIN, ICEA S-95-658/NEMA WC 70, PARAGRAPH 7.7.3.1, 45 MILS AVERAGE THICKNESS (36 MILS MINIMUM THICKNESS).

CONDUCTOR TO CONDUCTOR CHARACTERISTICS:

NOMINAL IMPEDANCE:	100 OHMS AT 25° C
NOMINAL ATTENUATION:	0.4 DB/100 FEET AT 1 MEGAHERTZ 1.1 DB/100 FEET AT 10 MEGAHERTZ 1.5 DB/100 FEET AT 25 MEGAHERTZ 2.5 DB/100 FEET AT 50 MEGAHERTZ
NOMINAL CAPACITANCE:	15.0 PICO FARADS/FOOT.
NOMINAL VELOCITY OF PROPAGATION:	66 PERCENT.
VOLTAGE WITHSTANDING:	2000 VOLTS RMS, MINIMUM.

MAXIMUM CONDUCTOR D.C. RESISTANCE: 4.53 OHMS/1000 FEET AT 25° C.

INSTALLATION LIMITATION: THE CABLE SHALL BE DESIGNED SUCH THAT THE MOISTURE BARRIER WILL NOT TEAR WHEN THE CABLE IS INSTALLED WITH A MINIMUM BENDING RADIUS OF 12 TIMES THE CABLE O.D.

FACTORY TESTS: CABLE SHALL MEET THE APPLICABLE REQUIREMENTS OF ICEA S-95-658/NEMA WC 70. SAMPLES OF THE COMPLETED CABLE SHALL ALSO PASS THE VERTICAL TRAY FLAME TEST REQUIREMENTS PER IEEE 383 SECTION 2.54 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

MAXIMUM O.D. SHALL BE .60 INCHES.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, AND 100 OHM TWINAX.

MANUFACTURERS

I.T.T. SURPRENANT DIVISION

THE ROCKBESTOS CO.

IPSC



CABLE SPECIFICATION

100 OHM FR-MR TWINAX

15,000 VOLTS	SINGLE CONDUCTOR (GROUNDED NEUTRAL) (100 PERCENT INSULATION LEVEL)	FLAME RETARDANT POWER CABLE	TYPE <u> A </u> SPEC <u> </u> PROJECT <u> </u>
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STANDARD SPECIFICATIONS

 REFERENCE: ICEA S-93-639/NEMA WC 74, IEEE 1202 (ANSI N41.10).

 CONDUCTOR: CONCENTRIC-LAY COATED COPPER, STRAND CLASS B, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

 CONDUCTOR SHIELD: EXTRUDED SEMICONDUCTING THERMOSETTING MATERIAL, 12 MIL MINIMUM THICKNESS.

 INSULATION: ETHYLENE-PROPYLENE RUBBER, ICEA S-93-639, PART 3, NOT LESS THAN 175 MILS AVERAGE THICKNESS (158 MILS MINIMUM THICKNESS).

 INSULATION SHIELD: SEMICONDUCTING PAINT, SEMICONDUCTING TAPE, AND COATED 5 MIL COPPER TAPE ICEA S-93-639, PART 4. COPPER TAPE SHALL BE HELICALLY APPLIED WITH A MINIMUM OVERLAP OF 25 PERCENT.

 JACKET: CHLOROSULFONATED POLYETHYLENE, ICEA S-93-639, PARAGRAPH 4.4.9.

 FACTORY TESTS: CABLE SHALL MEET THE REQUIREMENTS OF ICEA S-68-516 AND AEIC NO. CS6. FINISHED CABLES SHALL ALSO MEET THE VERTICAL TRAY FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS


CONDUCTOR				
SIZE (AWG OR MCM)	NO. OF STRANDS	*JACKET THICKNESS (INCHES)	MAX	O.D. (INCHES)
2	7	.080		1.02
1	19	.080		1.07
1/0	19	.080		1.11
2/0	19	.080		1.16
4/0	19	.080		1.27
250	37	.080		1.31
350	37	.080		1.44
500	37	.080		1.57
750	61	.080		1.84
1000	61	.110		2.08

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

THE COLOR OF THE INSULATION SHALL BE IN CONTRAST TO THE COLOR OF THE SEMICONDUCTING PAINT. THE SEMICONDUCTING PAINT SHALL BE READILY REMOVABLE FOR TERMINATING.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, AND VOLTAGE CLASS.

VOLTAGE TEST AFTER INSTALLATION:
 DC TEST VOLTAGE - 55 KV
 DURATION OF TEST - 15 MINUTES

IPSC  <small>INTERMOUNTAIN POWER SERVICE CORPORATION</small>		15-1-FR-EPR-CSP-SH-GND
	CABLE SPECIFICATION	

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70.

CONDUCTOR: 10 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 30 MILS AVERAGE THICKNESS (27 MILS MINIMUM THICKNESS).

SHIELD: NONE.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-66-524, PARAGRAPH 7.4.7.3, ASSEMBLY JACKET APPLIED OVER TAPE WRAPPED CABLE CORE.

CONDUCTOR IDENTIFICATION: ICEA S-95-658, APPENDIX K, METHOD 1, COLORED COMPOUNDS WITH TRACERS, TABLE K-2. WHITE OR GREEN CONDUCTORS SHALL NOT BE PROVIDED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-66-524, PARAGRAPH 7.8.9. THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE STANDARD NO. 383 (ANSI N41.10) USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

NUMBER OF CONDUCTORS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
2	0.045	.55
3	0.045	.61
4	0.060	.66
5	0.060	.72
6	0.060	.77
7	0.060	.77
8	0.060	.84
9	0.060	.94
10	0.080	1.01
12	0.080	1.04
15	0.080	1.15

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-MULTI-FR-XLP-CSP

CABLE SPECIFICATION

600 VOLT SINGLE AND MULTIPLE PAIR (ANSI TYPE EX) FLAME RETARDANT THERMOCOUPLE
EXTENSION CABLE

TYPE EX
SPEC _____
PROJECT _____

STANDARD SPECIFICATIONS

REFERENCE: ANSI MC96.1, ICEA S-95-658/NEMA WC70.

CONDUCTOR: 16 AWG, SOLID ALLOY, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-66-524, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

LAY: TWISTED PAIRS WITH 3 INCH MAXIMUM LAY.

SHIELD: SINGLE PAIR-CABLE ASSEMBLY ONLY: MULTIPLE PAIR-EACH PAIR AND CABLE ASSEMBLY: COMBINATION ALUMINUM-POLYESTER TAPE AND 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS. SHIELD TAPE ON PAIR ASSEMBLY SHALL BE APPLIED IN SUCH A WAY AS TO GIVE TOTAL SHIELD ISOLATION FROM ALL OTHER PAIR SHIELDS.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-66-524, PARAGRAPH 7.4.7.3.

CONDUCTOR IDENTIFICATION: SEE "CABLE DETAILS" BELOW.

MULTIPLE PAIR IDENTIFICATION: EACH PAIR NUMBERED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-669524, PARAGRAPH 7.8.9. THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

ANSI TYPE	CONDUCTOR MATERIAL		COLOR CODE CONDUCTOR		CABLE ASSEMBLY JACKET
	POSITIVE	NEGATIVE	POSITIVE	NEGATIVE	
EX	CHROMEL	CONSTANTAN	PURPLE	RED	PURPLE
	NUMBER OF PAIRS		*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX. (INCHES)	
	1		.045	.39	
	4		.060	.76	
	6		.060	.96	
	8		.080	1.04	
	10		.080	1.20	
	12		.080	1.25	
	16		.080	1.38	

THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, TYPE EX, CONDUCTOR SIZE, NUMBER OF PAIRS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

CABLE SPECIFICATION

600-SINGLE-MULTI-PR-THERMO-
EXT-RP XLP-CSP-EX

IP7011964

600 VOLT FLAME RETARDANT SINGLE AND MULTIPLE PAIR SHIELDED INSTRUMENT CABLE
(PAIRS NOT SHIELDED)

TYPE F
SPEC _____
PROJECT _____

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: 16 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

LAY: TWISTED PAIRS WITH 2-1/2 TO 3-1/2 INCH LAY STAGGERED.

SHIELD: CABLE ASSEMBLY; COMBINATION ALUMINUM-POLYESTER TAPE AND 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.4.7.3.

CONDUCTOR IDENTIFICATION IN EACH PAIR: ONE CONDUCTOR BLACK, ONE CONDUCTOR WHITE.

MULTIPLE PAIR IDENTIFICATION: EACH PAIR NUMBERED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-66-524, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMersed IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMersed, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

NUMBER OF CONDUCTORS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
1	.045	.41
3	.060	.67
5	.060	.84
7	.060	.86
9	.080	.99
12	.080	1.15

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF PAIRS, AND VOLTAGE CLASS.

IPSC



CABLE SPECIFICATION

600-SINGLE-MULTI, PAIRS-SH-
INSTR-FR-XLP-CSP

IP7011965

HIGH TEMPERATURE	SINGLE PAIR (ANSI TYPE EX)	THERMOCOUPLE EXTENSION CABLE	TYPE <u>EH</u> SPEC _____ PROJECT _____
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STANDARD SPECIFICATIONS

REFERENCE: ANSI MC96.1, ICEA S-61-402.

CONDUCTOR: 20 AWG, SOLID ALLOY, NORMAL MAXIMUM OPERATING TEMPERATURE 200° C.

INSULATION: FEP FLUOROCARBON NOT LESS THAN 12 MILS AVERAGE THICKNESS (10.8 MILS MINIMUM THICKNESS).

LAY: TWISTED PAIR WITH 2 INCH MAXIMUM LAY.

*SHIELD: CABLE ASSEMBLY: ALUMINUM/NOMEX TAPE AND 7 STRAND, 22 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: FEP FLUOROCARBON, 15 MILS AVERAGE THICKNESS, (12 MILS MINIMUM THICKNESS).

CONDUCTOR IDENTIFICATION: SEE "CABLE DETAILS" BELOW.

FACTORY TESTS: INSULATION AND JACKET MATERIALS SHALL MEET THE REQUIREMENTS INDICATED ON OZ1507 SHEET 2 WHEN TESTED IN ACCORDANCE WITH THE TEST METHODS OUTLINED IN PART 6 OF ICEA S-61-402.

CABLE DETAILS

CONDUCTOR MATERIAL			COLOR CODE CONDUCTOR		CABLE ASSEMBLY JACKET	O.D. MAX (INCHES)
ANSI TYPE	POSITIVE	NEGATIVE	POSITIVE	NEGATIVE		
EX	CHROMEL	CONSTANTAN	PURPLE		RED	PURPLE
						.20

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, TYPE EX, CONDUCTOR SIZE, NUMBER OF PAIRS, AND VOLTAGE CLASS.


MANUFACTURERS

EATON CORP., SAMUEL MOORE OPERATIONS, DEKORON DIV.

THE ROCKBESTOS CO.

THERMO ELECTRIC.

*Negotiated Revision

		H TEMP SINGLE PR- THERMO-EXT-EX
	CABLE SPECIFICATION	

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: CONCENTRIC-LAY, 7 STRAND, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 45 MILS AVERAGE THICKNESS (40.5 MILS MINIMUM THICKNESS).

SHIELD: NONE.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.4.7.3.

CONDUCTOR IDENTIFICATION: ICEA S-95-658, PARAGRAPH 5.5.1.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER 4.5 KV AC OR 13.5 KV DC. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS-BURNER FLAME SOURCE.

CABLE DETAILS

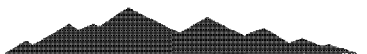
PHASE CONDUCTOR SIZE (AWG)	GROUND CONDUCTOR* SIZE (AWG)	**ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
8	10	0.060	.71
6	8	0.060	.79
4	8	0.060	.94
2	6	0.060	1.08

* ONE BARE COPPER GROUND CONDUCTOR IN ONE INTERSTICE.

** THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-SINGLE-MULTI, PAIRS-SH-
INSTR-FR-XLP-=CSP

CABLE SPECIFICATION

600 VOLT FLAME RETARDANT MULTIPLE PAIR SHIELDED INSTRUMENT CABLE
(PAIRS SHIELDED)

TYPE G
SPEC _____
PROJECT _____

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: 16 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

LAY: TWISTED PAIRS WITH 2-1/2 TO 3 INCH LAY.

SHIELD: EACH PAIR AND CABLE ASSEMBLY; COMBINATION ALUMINUM-POLYESTER TAPE AND 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS. SHIELD TAPE ON PAIR ASSEMBLY SHALL BE APPLIED IN SUCH A WAY AS TO GIVE TOTAL SHIELD ISOLATION FROM ALL OTHER PAIR SHIELDS.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.4.7.3.

CONDUCTOR IDENTIFICATION: ONE CONDUCTOR BLACK, ONE CONDUCTOR WHITE.

MULTIPLE PAIR IDENTIFICATION: EACH PAIR NUMBERED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

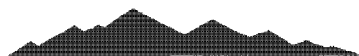
CABLE DETAILS

NUMBER OF PAIRS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
3	.060	.74
5	.060	.89
7	.060	1.03
9	.080	1.18
12	.080	1.34

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF PAIRS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-MULTI, SH-PAIRS-INSTR-FR-
XLP-CSP

CABLE SPECIFICATION

IP7011968

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: 16 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

LAY: TWISTED TRIAD WITH 2 INCH LAY.

SHIELD: CABLE ASSEMBLY: COMBINATION ALUMINUM-POLYESTER TAPE AND 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.4.7.3.

CONDUCTOR IDENTIFICATION: ONE CONDUCTOR BLACK, ONE CONDUCTOR WHITE, ONE CONDUCTOR RED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMersed IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMersed, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
.045	.43

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-3-COND-SH-INSTR-FR-XLP-
=CSP

CABLE SPECIFICATION

600 VOLT FLAME RETARDANT MULTICONDUCTOR NO. 14 AWG CONTROL AND POWER CABLE

TYPE E
SPEC _____
PROJECT _____

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70.

CONDUCTOR: 14 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 30 MILS AVERAGE THICKNESS (27 MILS MINIMUM THICKNESS).

SHIELD: NONE.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.4.7.3, ASSEMBLY JACKET APPLIED OVER TAPE WRAPPED CABLE CORE.

CONDUCTOR IDENTIFICATION: ICEA S-95-658, APPENDIX K, METHOD 1, COLORED COMPOUNDS WITH TRACERS, TABLE K-2. WHITE OR GREEN CONDUCTORS SHALL NOT BE PROVIDED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-66-524, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE STANDARD NO. 383 (ANSI N41.10) USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

NUMBER OF CONDUCTORS	*ASSEMBLY JACKET THICKNESS (INCHES)	O.D. MAX (INCHES)
2	.045	.44
3	.045	.46
4	.045	.50
5	.045	.54
6	.060	.61
7	.060	.61
8	.060	.66
9	.060	.71
10	.060	.75
11	.060	.78
12	.060	.85

* THE AVERAGE THICKNESS SHALL BE NOT LESS THAN THAT INDICATED ABOVE. THE MINIMUM THICKNESS SHALL BE NOT LESS THAN 80 PERCENT OF THE VALUES INDICATED ABOVE.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.

IPSC




INTERMOUNTAIN POWER SERVICE CORPORATION

600-MULTI, -FR-XLP-CSP

CABLE SPECIFICATION

IP7011970

HIGH TEMPERATURE SINGLE PAIR (ANSI TYPE EX)		THERMOCOUPLE EXTENSION CABLE	TYPE EH SPEC PROJECT
FACTORY TEST REQUIREMENTS FOR FEP FLUOROCARBONS INSULATION AND JACKET MATERIALS			
PHYSICAL REQUIREMENTS:			
* TENSILE STRENGTH, MINIMUM, PSI.			2000
ELONGATION AT RUPTURE, MINIMUM, PERCENT.			150
AGING REQUIREMENTS:			
AFTER AIR OVEN TEST AT $230^{\circ}\text{C} \pm 1^{\circ}\text{C}$ FOR 168 HOURS, TENSILE STRENGTH AND ELONGATION AT RUPTURE, MINIMUM PERCENTAGE OF UNAGED VALUE.			80
AFTER OIL IMMERSION AT $121^{\circ}\text{C} \pm 1^{\circ}\text{C}$ FOR 18 HOURS, TENSILE STRENGTH AND ELONGATION AT RUPTURE, MINIMUM PERCENTAGE OF UNAGED VALUE.			85
HEAT DISTORTION, $200^{\circ}\text{C} \pm 1^{\circ}\text{C}$, MAXIMUM, PERCENTAGE OF UNAGED VALUE.			20
HEAT SHOCK, $230^{\circ}\text{C} \pm 1^{\circ}\text{C}$.			NO CRACKS
cold bend, $-65^{\circ}\text{C} \pm 1^{\circ}\text{C}$.			NO CRACKS
FLAME RESISTANCE.			PASS
ELECTRICAL REQUIREMENTS:			
SPARK TEST VOLTAGE ON INDIVIDUAL INSULATED CONDUCTORS, KV.			2.3 AC OR 7.0 DC
VOLTAGE TEST ON COMPLETED CABLES WITHOUT IMMERSION IN WATER, KV.			1.5 AC OR 4.5 DC
INSULATION RESISTANCE AT 15.6°C , K CONSTANT.			50,000
TEMPERATURE CORRECTION COEFFICIENT.			1.00
DIELECTRIC CONSTANT AFTER 24 HOURS AT $75^{\circ}\text{C} \pm 1^{\circ}\text{C}$, MAXIMUM.			2.1
 <small>INTERMOUNTAIN POWER SERVICE CORPORATION</small>			600-MULTI, -FR-XLP-CSP
CABLE SPECIFICATION			

IP7011971

600 VOLT FLAME RETARDANT TWO PAIR SHIELDED MODEM INTERCONNECTION CABLE
(PAIRS SHIELDED)

TYPE I
SPEC _____
PROJECT _____

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: 16 AWG, 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

LAY: TWISTED PAIRS WITH 2-1/2 TO 3 INCH LAY.

SHIELD: EACH PAIR; COMBINATION ALUMINUM-POLYESTER TAPE AND 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER DRAIN WIRE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS. SHIELD TAPE ON EACH PAIR ASSEMBLY SHALL BE APPLIED IN SUCH A WAY AS TO GIVE TOTAL ISOLATION FROM THE SHIELD ON THE OTHER PAIR ASSEMBLY.

MOISTURE BARRIER: DEAD SOFT ALUMINUM CONDUCTOR ASSEMBLY TAPE, 8 MILS NOMINAL THICKNESS WITH 2 MILS NOMINAL THICKNESS ETHYLENE COPOLYMER ADHESIVE COATING ON BOTH SIDES. COATED SURFACES SHALL BOND TO EACH OTHER AND TO THE JACKET IN A LONGITUDINAL SEAM. THE TAPE SHALL HAVE A MINIMUM OVERLAP OF 1/8 INCH. THE AVERAGE SEAL STRENGTH OF THE OVERLAP AND THE AVERAGE BOND STRENGTH OF THE JACKET TO TAPE SHALL BE 8 POUNDS PER INCH OF LENGTH (4 POUNDS MINIMUM).

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, 60 MILS AVERAGE THICKNESS (48 MILS MINIMUM THICKNESS).

CONDUCTOR IDENTIFICATION IN EACH PAIR: ONE CONDUCTOR BLACK, ONE CONDUCTOR WHITE.

PAIR IDENTIFICATION: EACH PAIR NUMBERED.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMersed IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMersed, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE. THE JACKET MATERIAL SHALL MEET THE REQUIREMENTS INDICATED ON DZ1408 WHEN TESTED IN ACCORDANCE WITH THE TEST METHODS OUTLINED IN PART 6 OF ICEA S-66-524.

INSTALLATION LIMITATIONS: THE CABLE SHALL BE DESIGNED SUCH THAT THE MOISTURE BARRIER WILL NOT TEAR WHEN THE CABLE IS INSTALLED WITH A MINIMUM BENDING RADIUS OF 12 TIMES THE CABLE O.D.

CABLE DETAILS

MAXIMUM O.D. SHALL BE .67 INCHES.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES, MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, CONDUCTOR SIZE, NUMBER OF PAIRS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-2-PAIR-MODEM-INTERCON-
FR-XLP-CPE

CABLE SPECIFICATION

IP7011972

600 VOLT FLAME RETARDANT TWO PAIR SHIELDED MODEM INTERCONNECTION CABLE
(PAIRS SHIELDED)

TYPE 1
SPEC
PROJECT

REQUIREMENTS FOR CHLORINATED POLYETHYLENE JACKET MATERIAL

PHYSICAL REQUIREMENTS:

* TENSILE STRENGTH, MINIMUM, PSI.	1400
TENSILE STRESS, AT 100 PERCENT ELONGATION, MINIMUM PSI	1000
ELONGATION AT RUPTURE, MINIMUM PERCENT	150

AGING REQUIREMENTS:

AFTER AIR OVEN TEST AT $121^{\circ}\text{C} \pm 1^{\circ}\text{C}$ FOR 168 HOURS,

TENSILE STRENGTH, MINIMUM PERCENTAGE OF UNAGED VALUE 85

ELONGATION AT RUPTURE, MINIMUM PERCENTAGE OF UNAGED VALUE 50

AFTER OIL IMMERSION AT $100^{\circ}\text{C} \pm 1^{\circ}\text{C}$ FOR 18 HOURS

TENSILE STRENGTH AND ELONGATION AT RUPTURE,
MINIMUM PERCENTAGE OF UNAGED VALUE 60

HEAT DISTORTION, $121^{\circ}\text{C} \pm 1^{\circ}\text{C}$, MAXIMUM PERCENT 20

HEAT SHOCK, $121^{\circ}\text{C} \pm 1^{\circ}\text{C}$ NO CRACKS

COLD BEND, MINUS $35^{\circ}\text{C} \pm 1^{\circ}\text{C}$ NO CRACKS

SPECIFIC SURFACE RESISTIVITY, MINIMUM MEGOHMS 20,000

ACCELERATED WATER ABSORPTION

75° C WATER, 7 DAYS IMMERSION, MAXIMUM
MILLIGRAMS PER SQUARE INCH 20

HALOGEN CONTENT, MAXIMUM PERCENTAGE BY WEIGHT 18

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-2-PAIR-MODEM-
INTERCON-FR-XLP-CPE

CABLE SPECIFICATION

IP7011973

STANDARD SPECIFICATIONS

REFERENCE: ICEA S-95-658/NEMA WC 70, IEEE 1202.

CONDUCTOR: 7 STRAND, CONCENTRIC-LAY, COATED COPPER, NORMAL MAXIMUM OPERATING TEMPERATURE 90° C.

INSULATION: FLAME RETARDANT CROSS-LINKED POLYETHYLENE, ICEA S-95-658, PARAGRAPH 7.8.3.1, NOT LESS THAN 25 MILS AVERAGE THICKNESS (22.5 MILS MINIMUM THICKNESS).

SHIELD: EACH CABLE SUB-ASSEMBLY: COMBINATION ALUMINUM-POLYESTER TAPE APPLIED TO ACHIEVE 100 PERCENT COVER OVER INSULATED CONDUCTORS. SUB-ASSEMBLY 1 SHALL INCLUDE A DRAIN WIRE. THE WIRE SHALL BE LOCATED UNDER THE ALUMINUM-POLYESTER TAPE. THE TAPE ON SUB-ASSEMBLY 1 SHALL BE APPLIED IN SUCH A WAY AS TO GIVE TOTAL SHIELD ISOLATION FROM ALL OTHER SUB-ASSEMBLY SHIELDS. SUB-ASSEMBLIES 2, 3, AND 4 SHALL INCLUDE A COMMON DRAIN WIRE.

DRAIN WIRES: 7 STRAND, 20 AWG MINIMUM SIZE, COATED COPPER.

CAPACITANCE: LESS THAN 50 PICO FARADS PER FOOT, CONDUCTOR TO CONDUCTOR, AND CONDUCTOR TO GROUNDED SHIELD.

JACKET: CONDUCTOR: NONE. CABLE ASSEMBLY: CHLOROSULFONATED POLYETHYLENE, ICEA S-65-658, PARAGRAPH 7.4.7.3, 60 MILS AVERAGE THICKNESS (48 MILS MINIMUM THICKNESS).

CONDUCTOR IDENTIFICATION: SEE "CABLE DETAILS" BELOW.

FACTORY TESTS: IN ADDITION TO THE TESTING SPECIFIED IN ICEA S-95-658, PARAGRAPH 7.8.9, THE INSULATED SINGLE CONDUCTORS SHALL BE IMMERSSED IN WATER FOR A MINIMUM OF 6 HOURS IMMEDIATELY PRIOR TO TESTING AND, WHILE STILL IMMERSSED, SHALL BE TESTED FOR 5 MINUTES UTILIZING EITHER THE AC OR DC TEST VOLTAGE GIVEN IN ICEA S-66-524, TABLE 7.8-1. EACH CONDUCTOR AND THE FINISHED CABLES SHALL ALSO MEET THE FLAME TEST REQUIREMENTS PER IEEE 383 USING A GAS BURNER FLAME SOURCE.

CABLE DETAILS

CABLE SUB- ASSEMBLY	NO. OF CONDUCTORS	CONDUCTOR SIZE (AWG)	SUB-ASSEMBLY LAY (INCHES MAX.)	SUB-ASSEMBLY CONDUCTOR COLOR CODE			
				FIRST	SECOND	THIRD	FOURTH
1	2	16	2.5	RED	BLACK		
2	4	20	-	WHITE	GREEN	WHITE/ RED	WHITE/ BLACK
3	1	20	-	WHITE/ YELLOW			
4	1	20	-	WHITE/ GREEN			

MAXIMUM O.D. SHALL BE .68 INCHES.

A DURABLE MARKING SHALL BE PROVIDED ON THE SURFACE OF THE CABLE AT INTERVALS NOT EXCEEDING 24 INCHES. MARKING SHALL INCLUDE MANUFACTURER'S NAME, INSULATING MATERIAL, NUMBER OF CONDUCTORS, AND VOLTAGE CLASS.

IPSC



INTERMOUNTAIN POWER SERVICE CORPORATION

600-8-TORQUE-METERING-FR-
XLP-CSP

CABLE SPECIFICATION

Section 16F - GROUNDING

16F.1 GENERAL. This section covers the furnishing and installation of grounding materials complete as indicated on the drawings and specified herein.

16F.2 MATERIALS. All grounding materials required shall be furnished new and undamaged in accordance with the following requirements.

Rods	3/4 inch 10 foot copper-clad standard type. The copper-cladding shall be electrolytically bonded to the steel rod or bonded by a molten welding process. Cold rolled copper-cladding is not acceptable. Ground rods shall be as manufactured by Blackburn or Weaver.
Cable	
Bare	Soft drawn copper, Class B stranding, ASTM B8
Insulated	Soft drawn copper, Class B stranding with green colored polyvinyl chloride insulation, UL 83, Type TW, THW, or THHN
Bus and bars	Soft copper, cross section not less than 1/8 inch thick by 1 inch wide, ASTM B187
Exothermal welds	Molds, cartridges, materials, and accessories as recommended by the manufacturer of the molds for the items to be welded. Cadweld heavy-duty or acceptable equal. Molds and powder shall be furnished by the same manufacturer.
Flush ground plates	Cadweld B-162 Series, B-164 Series, or acceptable equal ground plates with NEMA hole spacing

[IPP 9255 CONST MOD SERVICES 71.0603]
[040987]
16F-1

All clamps, connectors, bolts, washers, nuts, and other hardware used with the grounding system shall be of copper.

All clamps and other hardware of iron or steel used with the grounding system shall be hot-dip galvanized. Bolts, washers, and nuts shall be hot-dip galvanized steel or accepted type of stainless steel.

Grounding conductors are described on the Cable Specification sheets included in Section 16E.

16F.3 INSTALLATION. Grounding system materials shall be installed according to the drawings and the requirements which follow.

16F.3.1 Ground Grid. Buried grounding conductors extending beyond the foundations of buildings or structures shall have at least 18 inches of earth cover.

16F.3.2 Ground Rods. All ground rods shall be located as indicated on the drawings and installed to the depth indicated. Where the required ground rod length exceeds 10 feet, standard sections shall be welded together to provide an extended rod with one true center line and a minimum of joint resistance. During welding, the ground rod sections being welded shall be supported by a guide, Cadweld B-265 cable clamp or acceptable equal, to ensure proper alignment.

16F.3.3 Conductors. Exposed conductors shall be installed inconspicuously in vertical or horizontal positions on supporting structures. When located on irregular supporting surfaces or equipment, the conductors shall run parallel to or normal to dominant surfaces.

Conductors routed over concrete, steel, or equipment surfaces shall be kept in close contact with those surfaces by using fasteners located at intervals not to exceed 3 feet.

Damaged ground system conductors shall be repaired or replaced by the Contractor as directed by the Site Construction Manager.

16F.3.4 Connections. All connections shall be made by the exothermal welding process except where otherwise indicated on the drawings or in these specifications. The manufacturer's instructions on the use of exothermal welding materials shall be followed in all details. All surfaces to be joined by the welds shall be thoroughly cleaned. Paint, scale, and other deleterious substances shall be removed from surfaces of ungalvanized structural steel members by grinding. Galvanized steel surfaces shall be cleaned with emery paper. Powder and molds shall be kept dry and warm until used. Worn or damaged molds shall not be used.

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[040987]
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Where flush ground plates are to be embedded in the concrete, the plates shall be carefully located and firmly secured to the forms. The grounding cable shall be exothermally welded to the plate.

All exothermally welded connections shall successfully resist moderate hammer blows. Any connection which fails such test or which, upon inspection, indicates a porous or deformed weld shall be remade.

All exothermal welds shall encompass 100 per cent of the ends of the materials being welded. Welds which do not meet this requirement shall be remade.

Worn, damaged, incorrectly sized, or improperly shaped molds which, in the opinion of the Site Construction Manager, do not make satisfactory welds shall be removed from the jobsite.

All bolted and screwed connections shall be securely tightened.

16F.3.5 Conduit Grounding. All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with a bare copper conductor.

Grounding bushings shall be grounded with conductors sized in accordance with NEC, but not smaller than 8 AWG.

All grounding bushings on conduit runs which are terminated at tray shall be connected to the tray grounding cable with bare copper conductor sized as specified above.

Where a conduit run is terminated at tray and the conduit carries a separate grounding conductor, this grounding conductor shall be terminated on the tray grounding cable. If the conduit run is terminated with a grounding bushing and the separate ground conductor it carries is sized in accordance with the requirements of the preceding paragraph for conduit bushing grounding, the ground conductor in the conduit run shall be continued through the conduit bushing ground connection and terminated on the tray grounding cable making unnecessary the installation of a separate conduit bushing grounding cable.

16F.3.6 Tray Grounding. A bare grounding conductor shall be installed the entire length of cable trays installed under these specifications. Grounding shall be as indicated on the drawings. The grounding conductor shall be connected to each tray section and the tray grounding system shall be connected to the station ground grid as indicated on the drawings.

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[040987]
16F-3

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16F.3.7 Equipment Grounding. All electrical equipment shall be connected to the ground grid with copper grounding conductor. The term "electrical equipment," as used in this article, shall include all enclosures containing electrical connections or bare conductors except that individual devices such as solenoids, pressure switches, and limit switches shall be exempt from this requirement unless the device requires grounding for proper operation. Large equipment such as metal-clad or metal-enclosed switchgear will be furnished with a grounding bus which the Contractor shall connect to the ground grid. Most other equipment will be furnished with grounding pads and/or grounding lugs which the Contractor shall connect to the ground grid. All ground connection surfaces shall be cleaned immediately prior to connection. The Contractor shall furnish all grounding material required but not furnished with the equipment.

Where ground grid extension stingers are indicated on the drawings to be provided for connection to electrical equipment, the Contractor shall connect the bare grounding conductor to the equipment ground bus, pad, or lug. In addition to the ground grid extension stingers, a ground conductor shall be provided from the tray ground cable to the incoming line end of the ground bus in each assembly of metal-enclosed switchgear and in each motor control center. Where a power circuit cable includes a ground conductor with the phase conductors, the ground conductor shall be connected to the equipment grounding facilities and to the source ground bus. Where a ground conductor is not included with the phase conductors and a separate ground conductor circuit is required, the equipment shall be grounded by connecting the separate ground cable to the equipment grounding facilities and to the tray, pull box, junction box, or other item of equipment. A spare conductor of a multiconductor circuit may be utilized as a ground conductor provided that the conductor is wrapped with green tape at both the origin and termination. Where equipment grounding is required but no equipment grounding is indicated on the drawings and there is no spare conductor included with the phase conductors which can be used for grounding, the equipment shall be grounded in a manner acceptable to the Site Construction Manager. Except where otherwise indicated on the drawings, all equipment ground conductors which are not an integral part of a cable assembly shall be sized in accordance with the requirements of NEC. All ground conductors installed in conduit shall be insulated.

Suitable grounding facilities, acceptable to the Site Construction Manager, shall be furnished on electrical equipment not so equipped. The grounding facilities shall consist of compression type terminal connectors bolted to the equipment frame or enclosure and providing a minimum of joint resistance.

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The conduit system is not considered to be a grounding conductor except for itself and for lighting fixtures. No grounding conductor shall be smaller in size than 12 AWG unless it is a part of an acceptable cable assembly.

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[040987]
16F-5

IP7011979

INTERMOUNTAIN POWER SERVICE CORPORATION
PLANT ADMINISTRATIVE INSTRUCTION

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN
FOR THE INTERMOUNTAIN GENERATING STATION
AND THE INTERMOUNTAIN CONVERTER STATION
TITLE

PAI #101
NUMBER

4
REVISION NO.

Blaine Ipson, and Ron Westlund
REVISED BY

Dennis K. Killian
APPROVED BY

S. Gale Chapman
PLANT MANAGER

10/26/01
DATE

Craig Lucy
ORIGINAL BY

12/19/86
DATE

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Spill Prevention Control and Countermeasure (SPCC) Plan

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PLANT ADMINISTRATIVE INSTRUCTION

1.0 Title

**SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN
FOR THE INTERMOUNTAIN GENERATING STATION AND THE
INTERMOUNTAIN CONVERTER STATION**

2.0 Purpose

The purpose of this PAI is to establish procedures and methods to minimize the potential for oil discharges, and to ensure materials, equipment, and trained personnel are available to clean up any spill that might occur.

3.0 Scope

This PAI applies to all IPSC employees.

4.0 Guidelines and Procedures

Following this introduction is the Spill Prevention Control and Countermeasure (SPCC) Plan, and the Oil Spill Contingency Plan (OSCP). The SPCC plan shall be reviewed and evaluated at least once every three years.

**SPILL PREVENTION CONTROL
AND COUNTERMEASURE (SPCC) PLAN
ENVIRONMENTAL PROTECTION AGENCY REGULATIONS**

Intermountain Power Service Corporation

Facility: Intermountain Generating Facility - Intermountain
Generating Station and Intermountain Converter Station

Address: 850 West Brush Wellman Road, Delta, Utah 84624-9546

REVIEW/REVISION			
DATE	ENGINEER	LICENSE #	DESCRIPTION
05/06/86	John Schumann	CE 20338	CA Revision 0
12/01/89	H. Blaine Ipson	7979 UT	Review of Revision 0
03/28/91	H. Blaine Ipson	7979 UT	Revision 1
01/04/94	H. Blaine Ipson	7979 UT	Revision 2
01/02/97	H. Blaine Ipson	168299 UT	Revision 3
08/17/99	H. Blaine Ipson	168299 UT	Review of Revision 3
	H. Blaine Ipson	168299 UT	Revision 4

IP7011984

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SECTION 1 - APPROVAL AND CERTIFICATION

- 1.0 **Management Approval** - Full approval is extended by Management at a level with authority to commit the necessary resources, including manpower, equipment, and materials that may be required to expeditiously control and remove any oil discharge into or upon the navigable waters of the United States. This Spill Prevention Control and Countermeasure (SPCC) Plan will be implemented as herein described.

Signature: _____

Date: _____

Name: S. Gale Chapman

Title: President & Chief Operations Officer

- 1.1 **Certification** - I hereby certify that I have examined this facility, and being familiar with the provisions of Environmental Protection Agency (EPA) regulations, 40 CFR 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

Signature: _____

Date: _____

Name: Hyrum Blaine Ipson

Registration No.: 168299

State: Utah

SECTION 2 - DEFINITIONS

2.0 Spill Prevention Control and Countermeasure (SPCC) Plan

"Owners or operators of... facilities in operation on or before the effective date of this part that have discharged or, due to their location, could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or onto the navigable waters of the United States or adjoining shorelines, shall prepare a Spill Prevention Control and Countermeasure (SPCC) Plan, in writing and in accordance with 112.7..." [40 CFR 112.3 (a)]. This document is intended to fulfill these requirements, and to provide guidance for IPSC employees in understanding the scope of, and, complying with the requirements of these regulations. It also contains an Oil Spill Contingency Plan (OSCP) as Exhibit #1 to this document.

2.1 Oil Spill Contingency Plan (OSCP)

This plan is required by 40 CFR 109.5 for facilities that do not have adequate containment capacity for oil. It is located in Exhibit #1. It is a detailed blueprint for spill response and reporting.

2.2 Navigable Waters

2.2.1 All navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 Amendments to the FWPCA (Publ. L. 92-500) and tributaries of such waters.

2.2.2 Interstate waters.

2.2.3 Intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes.

2.2.4 Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.

2.2.5 Waste treatment systems, such as treatment ponds or lagoons, are presently excluded from being classified as navigable waters.

2.3 Waters of the State (Utah State R317-8-1.5 (58))

This is a Utah State definition, and is more restrictive than the Federal "Navigable Waters" definitions. It will apply to the Project more directly than will the definition of "navigable waters."

"Waters of the State' means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish or wildlife, shall not be considered to be 'Waters of the State.' The exception for confined bodies of water does not apply to any waters which meet the definition of 'Waters of the

United States' under 40 CFR 122.2. Waters are considered to be confined to and retained with the limits of private property only if there is no discharge or seepage to either surface water or groundwater. 'Waters of the State' include 'wetlands' as defined in the Federal Clean Water Act."

2.4 Oil

Oil of any kind or in any form including, but not limited to, petroleum, fuel oil, sludge, oil refuse, oil mixed with wastes, and insulating oil.

2.5 Discharge of Oil

Includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil.

2.6 Oil Spill as Defined by EPA

A discharge of oil into or upon the navigable waters of the United States or adjoining shorelines in quantities harmful to public health or welfare, including discharges which:

1. Violate state water quality standards.
2. Cause a sheen or film on the water.

It should be noted that 40 CFR 112.4 (a) requires that any facility which has discharged more than 1000 gallons of oil into or upon navigable waters of the United States in a single spill event; or has discharged oil in harmful quantities as defined above into or upon the navigable waters of the United States in two spill events within any twelve-month period is required to submit the SPCC plan and other information to the EPA Regional Administrator and the state for review. The EPA could then require specific amendments be made to the SPCC plan if they felt it was not adequate.

SECTION 3 - INTRODUCTION

3.0 General Description

The Intermountain Generating Facility (IGF) is located approximately 100 miles southwest of Salt Lake City near Delta, Utah (see Exhibit #2). The IGF consists of the Intermountain Generating Station (IGS), the Intermountain Converter Station (ICS), and Intermountain Railcar (IR) located at Springville, Utah, approximately 90 miles northeast of Delta. IR is covered under its own SPCC Plan (PAI #102), no further reference will be made regarding IR in this PAI. The IGF is designed to supply electrical power to purchasers in Utah and California. The IGF consists of two coal-fired boilers of 875 gross megawatts each. The ICS is the northerly terminus of the 490-mile, \pm 500-kV direct-current transmission line to Adelanto, California. The IGF gets surface water for cooling from the Sevier River. The water intake reservoir and pump facilities for water from the Sevier River are located approximately 10 miles southeast of the main facility at the DMAD Reservoir. The IGF is located in a remote, arid area (average annual rainfall of under 8 inches) and is not located near any navigable waters.

There are two main drainages on the industrialized part of the plant site. One drainage runs to a series of lined ponds that end with lined evaporation ponds. The other drainage runs into a channel which runs along the southern site boundary, and then back towards the center of the site where the water could be pumped back into the lined waste water pond.

The IGF is a zero discharge plant and has not been required to apply for a NPDES or UPDES permit.

3.1 SPCC Plan Necessity

Federal regulations require that any onshore facility that has more than **1320 gallons of petroleum products stored above ground, and that "...can reasonably be expected to discharge oil into or upon the navigable waters of the United States..."** must have a written plan (SPCC Plan) to minimize oil spill potential and expedite spill cleanup. If both of these conditions are not present, an SPCC plan is not necessary with the federal laws. Utah State laws do not require an SPCC Plan.

At the IGF, there are approximately 576,380 gallons of oil in oil filled equipment. There is also, approximately, an additional 1,503,262 gallons of oil storage tank capacity (see Exhibit #3 for more details). However, the IGF is so remote, so dry, and so flat that there is no reasonable possibility that any oil spill could flow into navigable waters. Technically, the IGF site is exempt from federal SPCC regulations.

The water intake structure and pump house at the DMAD Reservoir is situated so that the potential for an oil spill exists. At the DMAD pump house, there is a total of 1042 gallons of oil contained in equipment and no single piece of equipment with over 660 gallons. This is less than the 1320 gallons required by 40 CFR 112.1(d)(2)(ii). Technically, the DMAD pump house is also exempt from federal SPCC regulations.

IPSC management feels that if these regulations are given a reasonable interpretation, our facilities would not be subject to regulation under 40 CFR 112. However, IPSC management feels that preparation for unlikely or infrequent events such as an oil spill is a good policy. IPSC will maintain and implement a SPCC Plan.

SECTION 4 - GENERAL

- 4.0 The SPCC Plan shall be kept in the office of the Assistant Superintendent of Technical Services - Computer/Environmental in the Administration Building of the facility.
- 4.1 The SPCC Plan shall be made available to EPA personnel or state regulatory personnel for on-site review during normal working hours.
- 4.2 The SPCC Plan must be reviewed every three years and amended within six months of review, if necessary, with the amendments approved by a registered professional engineer. The original SPCC Plan date and subsequent review dates must be listed in the SPCC Plan with the name and license number of a registered professional engineer.

- 4.3 Any change in the IGF, whether construction, operation, design, or maintenance, which will materially affect this facility's potential to discharge oil into navigable waters, will require amendments to the SPCC Plan. Any changes to the SPCC Plan must be certified by a registered professional engineer.
- 4.4 The Assistant Superintendent of Technical Services - Computer/Environmental shall be responsible for all records (except for training) concerning this Plan. Records will be signed, dated, and retained for at least three (3) years.
- 4.5 All documentation, tests, and records of inspections will be attachments to the SPCC Plan, and stored with the Plan in the office of the Assistant Superintendent of Technical Services - Computer/Environmental. These documents will be kept for at least three (3) years.

SECTION 5 - SPCC PLAN

The following section covers the information, where applicable to our site, required to be contained in the SPCC Plan by 40 CFR 112.7, paragraphs (a) through (e).

5.0 Oil Spills at IGF [40 CFR 112.7 (a)]

In the event of an oil spill on navigable water, the Incident Commander (PAI #105, #106) will gather all information available about the conditions that preceded the spill, the spill discovery, spill cleanup, corrective action taken (not necessarily against individuals), and plans for preventing a recurrence of another spill. The Assistant Superintendent of Computer/Environmental will ensure that this information is compiled into a written description of the spill and analysis of the causes, and list the plans and actions that will be taken to guarantee that a similar oil spill does not recur. This description of the spill event will be placed in the SPCC Plan as Exhibit #4, and will undergo full Staff scrutiny. If a deficiency is found in the SPCC Plan after a careful analysis of a spill event, the Plan will be modified to correct the problem.

5.1 Oil Spill Quantity Potential and Flow Directions [112.7 (b)]

Any discussion of oil spills at the IGF must take three facts into account:

- (1) Most of the oil storage tanks have secondary containment around them adequate to contain the contents of the largest tank in its containment area.
- (2) Most of the IGF oil filled equipment drains flow into oil/water separators where the majority of the oil will be captured, or they have secondary containment around them. Just before the main drainage ditch empties into the first of the lined ponds, all of the water must pass through an oil skimming weir which is the last oil collection structure prior to entrance into our industrial waste water ponds.
- (3) Any oil spills not contained in secondary containment or oil/water separators would be contained on site. No oil will leave the site. The IGF site is more than 4600 acres in area. The generating units and supporting structures and the converter yard use only about 620 acres. The remaining unimproved 3980 acres generally drain to the southwest. The industrialized area of the plant is drained by two ditch systems, neither of

which leaves the plant site. IGS was designed as a zero discharge facility and has a series of lined waste water ponds that contain all water discharges from the plant. All storm water is routed to these lined ponds or to a storm water runoff detention ditch that is pumped into a nearby lined pond.

- (4) As mentioned above, the IGF has numerous oil storage tanks as well as equipment which uses oil. A summary of the tanks and equipment follows:

AC Switch Yard

In the AC Switch Yard, the largest equipment without sump protection is the Bank M transformers. There are four of these transformers, and each contains more than 22,600 gallons of oil. The transformers are surrounded by a gravel filled concrete berm which would help to keep the spill localized. If one of these transformers failed, the flow would be into the surrounding gravel. If it was storming at the time of the spill, the dirt and gravel could become saturated with water and oil could then flow to the southern boundary ditch, and be routed into the storm water detention ditch. Once there, it would be removed from the surface of the water by vacuum equipment and absorbent booms and mats.

Transformer Banks K & L are protected by a gravel filled concrete berm. Both transformers have a capacity of over 9,500 gallons of oil. If a spill escaped the confining concrete, the oil would flow into the Converter Station evaporation pond, and from there would flow into the storm water collection ditch.

Converter Station

In the Converter Station, the largest equipment without sump protection is direct current transformers. There are seven (7) of these transformers, and each one contains 325 gallons of oil. The oil would flow into the south boundary ditch only in the event of heavy rainfall and saturated soil conditions.

Power Block, Electrical

In the Power Block, the largest electrical equipment without sumps is the Construction Substation Transformer and the Community Center Substation Transformer. Each transformer contains 1,123 gallons of oil. The oil from a spill from either of these transformers would flow only under saturated soil conditions and during a heavy rain. The flow would be to the south boundary ditch. It would then flow to the storm water runoff ditch.

Power Block, Mechanical

The largest single collection of oil filled equipment in this area is the Standby Boiler Feed Pump oil reservoir. If this container of 275 gallons was spilled, it would flow into an oil/water separator.

Oil and Fuel Tanks

All of the permanent fuel oil tanks have a sump surrounding them that can receive the tank contents and not overflow, with the exception of the fire pump fuel tank at the Community Center. If this tank were to spill during a storm when the soil was saturated, the diesel oil could possibly flow to the southern boundary ditch. It would then flow eventually to the Storm Water Detention Pond.

If a completely full turbine lube oil tank were to spill, it would overflow Oil Separator #3 (OS-3), and the excess oil (about 500 gallons) would flow into the main plant drainage ditch. At the end of this ditch, it would be captured by the oil skimming weir.

5.2 Appropriate Containment [112.7 (c)]

At the IGF, a major component of our oil containment program is dikes or berms around larger tanks (secondary containment) and a number of oil/water separators placed in drainage systems that are likely to receive oil in the event of a spill (see Exhibit #6). The IPSC Environmental Group monitors these separators to ensure that they do not become so full of oil that it passes through and into the pond systems. Because these separators are a main defense against oil spills reaching the pond system, no individual or group is allowed to dispose of oil into any drain without permission from the Environmental Group. Oil is to be collected and transported to the Utility Service Building (USB) and pumped into the used oil tank by the person(s) working with it. Should oil accidentally enter a drain, the Assistant Superintendent of Technical Services - Computer/Environmental, or in his absence a member of the Environmental Group, shall be contacted as soon as possible.

As stated above (5.1), the IGF site drainage is directed to a series of ponds or the storm water runoff ditch. There is a weir placed in the ditch just prior to the settling basin to skim any oil which may have entered the ditch. This weir is a last line of defense against oil contamination into the pond system. The Operations yard supervisor is responsible for cleaning and maintaining this weir. He shall inspect the weir and ditch weekly and clean the ditch as needed.

Oil absorbent mats and booms have been stored at the IGF site, as well as at the DMAD water intake facility, in order to allow fast and thorough response if a spill should occur.

5.3 Facility Drainage [112.7 (e)(1) (i) (ii) (iii)]

The IGF was designed as a zero discharge plant. All plant process water and storm water runoff from about half of the plant site drain into a series of lined ponds. These ponds act as storage vessels. Water from these ponds is pumped back into the plant to be used as makeup water for several important plant processes. As the water in a given pond becomes unacceptable in quality or the pond level reaches an unacceptable elevation, it is pumped to another stage in the process system. All plant process water terminates ultimately in the evaporation ponds. The only outlet is by evaporation.

There is a dike around the oil filled equipment inside the DMAD pump house. There is also a dike around the transformer outside the DMAD pump house

which would contain all of the oil which is in this transformer. These dikes will prevent any oil from reaching the DMAD reservoir (Sevier River). Parts iv and v do not apply to our facility.

5.4 Bulk Storage Tanks [112.7 (e)(2)(i)(ii)]

The regulations in 40 CFR 112.7(e)(2)(i)(ii) require that tanks be properly constructed of materials compatible with the product being stored. All tanks, both shop built and field erected, are made of steel. (See Exhibit #7 for tank construction standards.)

There are two (2) 675,000 gallon fuel oil tanks on site. The tanks are surrounded by large dikes, which are lined with 80 mil high density polyethylene. This lining has been designed to minimize the effects of water, sunlight, high or low temperatures, or petroleum products. The contained volume of each of these sump areas is more than 1,600,000 gallons. These sumps have no drains.

There are several other bulk storage and equipment day tanks on site. All but two of them drain into the main oil/water separator/weir system and drain into the settling basin. The oil/water separator by the thaw shed transformers drains into the clay lined coal pile runoff basin. The diesel fire pump fuel tank at the Community Center has no drain, and would discharge onto a concrete floor inside the building in the event of a spill or overflow.

5.5 Bulk Storage Tank Testing [112.7 (e)(2)(vi)]

The IGF bulk oil tanks will undergo integrity testing every five (5) years. The tanks will be tested for structural integrity by visual inspection, hydrostatic testing, or a system of nondestructive shell thickness testing.

The Assistant Superintendent of Technical Services - Engineering will be responsible for ensuring that these tests are completed and test documentation is stored with the SPCC Plan. The IPSC Computer/Environmental and Maintenance Departments will assist in choosing an appropriate test.

5.6 Bulk Storage Tank Failsafe Engineering [112.7 (e)(2)(viii)]

All bulk tanks, storage tanks, and day tanks have level monitoring equipment of some type. Currently, our storage tanks have either a local gauge or sight glass to determine level (option viii (D)). None of our tanks have high level warning devices installed. (See Exhibit #8 for tank level gauge equipment comparisons.)

5.7 Storage Tank Level Device Testing [112.7 (e)(2)(viii)(E)]

Bulk storage tank liquid level devices will be annually inspected and maintained. The IPSC I&C group will be responsible for maintenance of these devices.

5.8 Bulk Storage Tank and Piping Leaks [112.7 (e)(2)(x)]

Visible leaks from tanks and piping, gaskets, rivets, bolts, etc., will be promptly reported and repaired by the Maintenance Department.

5.9 Mobile Bulk Oil Storage Tank Positioning [112.7 (e)(2)(xl)]

There are six mobile storage tanks on site. These tanks are generally used only at the IGF. These tanks have secondary containment around them where they are stored consisting of concrete curbing. The curbing would more than contain the contents of the largest tank. They are mobile and may not always have containment around them when in use, but are monitored closely when in use. The IGF site is not subject to flooding or washout.

5.10 Facility Transfer Operations [112.7 (e)(3)(i)]

Any buried piping containing petroleum products shall be replaced with pipe that is not subject to corrosion, has a protective wrapping, or is cathodically protected.

5.11 Facility Transfer Operations Examinations [112.7 (e)(3)(iv)]

All above ground valves and pipelines containing petroleum are inspected regularly by Operations Department personnel. Operators check plant equipment twice per shift and enter equipment conditions in logs. Copies of Operators' logs documenting spills or leaks will be forwarded by the Assistant Superintendent of Operations on duty when the spill was discovered to the Assistant Superintendent of Technical Services - Computer/Environmental.

5.12 Facility Transfer Operations - Unloading [112.7 (e)(4)(i)(iii)(iv)]

Warning signs are installed at the truck unloading station. These signs will be a reminder to verify that the hoses have been disconnected and that the valves are closed prior to the driver leaving. Any spillage on the concrete ramp from truck unloading operations will drain to the secondary containment area around the fuel oil tanks. The unloading station meets minimum DOT Regulations.

5.13 Inspections and Records [112.7 (e)(8)]

All of the records required by this document in Sections 5.0, 5.5, and 5.11 will be kept with the SPCC Plan in the office of the Assistant Superintendent of Technical Services - Computer/Environmental.

Operators inspect equipment conditions twice per day and note these conditions in daily logs. In the event of a leak or a spill, the Assistant Superintendent of Operations on duty will provide copies of the Operators' inspection sheet and log sheet to the Assistant Superintendent - Computer/Environmental. Routine inspection sheets and logs will be archived normally with the Operations Department documentation.

Annually, the Assistant Superintendent of Technical Services - Computer/Environmental, or his designee, will complete visual inspections of all above ground petroleum storage tanks, related equipment, piping, and containment structures, including oil/water separators. The form found in Exhibit #9 will be used in this inspection, and the completed and signed forms will be stored with this Plan.

5.14 General Security [112.7 (e)(9)(i)(ii)(iii)(iv)]

The IGF is located in a sparsely populated desert located in west central Utah. The site is surrounded by a perimeter fence constructed of chain link. The site gates are locked or manned by professional guards. Due to the security system already in place and the remoteness of the facility, vandalism from outside individuals is not likely.

Discharge caused by an employee accidentally opening a discharge valve on a tank or piece of oil filled equipment is prevented by a strictly enforced tag-out procedure, and key locks placed on the drain valves of all tanks and oil filled equipment not in active or standby service.

The fuel oil tanks do not use pumps. The unloading trucks use pumps to fill the tanks. Oil to be used is gravity fed to pumps at the point of use in the building where the oil is used.

All unloading connections are capped when not in use. Each unloading connection has a manual valve and a check valve to prevent spilled oil when disconnecting the hoses.

5.15 Lighting Security [112.7 (e)(9)(v)]

There are lights around each tank that provide sufficient light to detect leaks by Operations Department personnel. Due to our location and the security measures already in place, lighting is adequate and more light will not provide any special protection from vandalism.

5.16 Personnel Training [112.7(e)(10)(i)(iii)]

Personnel who deal with oil and fuels, or who are responsible for spill cleanups, are trained in oil spill procedures, location of mats and booms, and applicable pollution control laws, rules, and regulations. The IPSC Safety/Training Section will have the responsibility of training and documenting the training of all affected personnel. All personnel training records will be kept in, and tracked by, the Safety/Training Section.

5.17 Responsible Individual [112.7 (e)(10)(ii)]

The Station Manager is responsible for all aspects of the SPCC Plan compliance.

The Assistant Superintendent of Operations on duty has been designated as the individual responsible for oil spill response and remediation, and for ensuring the SPCC Plan's operating provisions are carried out.

The Assistant Superintendent of Technical Services - Computer/Environmental is responsible for the content of the SPCC Plan, ensuring that the indicated testing, inspections, reporting, and documentation are handled properly, and that the Plan is properly updated. He is also designated to be the on-site Oil Spill Prevention Coordinator.

EXHIBIT #1

**OIL SPILL CONTINGENCY PLAN (OSCP)
Intermountain Power Service Corporation (IPSC)
Intermountain Generating Site**

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EXHIBIT #1

SECTION 1 - INTRODUCTION

The Oil Spill Contingency Plan (OSCP) is a detailed protocol on how to handle an emergency response. It explains what manpower, equipment, and materials are to be used to expeditiously control and remove any oil discharge from facility equipment. This OSCP is technically not required under 40 CFR 112.7 (d), since the IGF has the necessary structures and equipment in place to prevent discharged oil from reaching navigable waters. However, as in Section 3.1, of the SPCC Plan, of this PAI, IPSC Management thinks it is a good policy to have this OSCP.

SECTION 2 - SPILL NOTIFICATION PROCEDURES

2.0 Initial Notification

Initial notification of any oil spill into facility drains, ditches, ponds at the IGF or the release of oil in any quantity into the DMAD Reservoir shall be made, by the person discovering it, to the Control Operator by calling 2-911 or Channel #1 on the radio. The caller shall provide details of the spill that include, but are not limited to, the following information:

1. Estimated quantity of oil spill
2. Location and size of oil spill
3. Equipment involved
4. If a fire or fire hazard is present
5. If the fire is totally within the facility
6. If oil has entered or is likely to enter an external drainage which has no means of retaining the spill on site
7. If oil has spilled into or onto any waters, ditches, or ponds
8. If there are any personal injuries
9. If there are any injuries to wildlife

2.1 Facility Notification

The Assistant Superintendent of Operations on duty at the time of the spill shall be responsible for the notification of: 1) the Station Manager, 2) IPSC Staff members who would be affected by a spill, and 3) the Assistant Superintendent of Computer/Environmental, or in his absence, the Environmental Group. These contacts must be made as soon as possible if:

1. Protected wildlife has been injured, or contaminated.
2. Any oil was spilled into the DMAD Reservoir.

3. The spill had anything to do with an underground storage tank, either in filling the UST or filling equipment from the UST.
4. The spill was larger than 25 gallons.

2.2 Regulatory Notification

After consultation with and approval of the Station Manager and Staff, the Assistant Superintendent of Technical Services - Computer/Environmental shall be responsible for any necessary regulatory contact.

2.3 Media Notification

Only the Station Manager or his Staff designee will speak to the media concerning any aspect of an oil spill.

SECTION 3 - SPILL RESPONSE

3.0 Spill Response

The Control Operator will immediately inform the Assistant Superintendent of Operations on duty about any oil spill. The Assistant Superintendent of Operations will assume the role of Emergency Coordinator as per PAI #106. While oil spills are usually not "releases of hazardous materials," and in some instances spill response and cleanup can be handled routinely, in the following instances personnel and material must be made available immediately to contain and clean up the spill. Exhibit #10 is a summary decision tree. Immediate response is needed:

1. When the spill is on the DMAD Reservoir.
2. When waterfowl or other wildlife have been killed, immobilized, or contaminated with the spilled product, either at the DMAD Reservoir or at the IGS on-site ponds and ditches.

If a spill onto a pond has occurred, the propane cannons are generally deployed if any water birds are on the pond. The Environmental Group will be responsible for doing this upon notification of incident.

3.1 Cleanup

Cleanup of oil spills will be accomplished by emergency response crews as per PAI #106 using absorbent mats and booms. Detergents and dispersant may be used on IPSC ponds, but not on the DMAD Reservoir.

Oil soaked material will be brought to the USB where maintenance crews will run the material through an oil press. The recaptured oil and water mixture will be pumped to the used oil tank, and the nonbiodegradable absorbent will be land filled. Disposal of biodegradable oil contaminated material will be coordinated through the Environmental Group.

SECTION 4 - DOCUMENTATION AND RECORDS

4.0 Documentation

The Assistant Superintendent of Operations on duty will be responsible for ensuring proper documentation of the oil spill and the extent of contamination of the facility. He will be responsible for forwarding this information to the Assistant Superintendent of Technical Services - Computer/Environmental. Records are to be kept for reports that may be required. Records are to be kept with the SPCC Plan in the office of the Assistant Superintendent of Technical Services - Computer/Environmental.

4.1 Records

As stated in section 5.13 of the SPCC Plan, all records of inspections, testing results, oil spill, response documentation, etc., will be kept with the SPCC Plan in the office of the Assistant Superintendent of Technical Services - Computer/Environmental in the Administration Building at the Intermountain Generating Station, 850 W. Brush Wellman Road, Delta, Utah 84624-9546. As noted in Section 5.16 of the SPCC Plan, training records are kept and tracked by the Safety/Training Section.

SECTION 5 - GOVERNMENT AGENCY INSPECTION

The federal or state government may require that one of its agencies inspect the oil spill site after cleanup procedures have been completed. The Assistant Superintendent of Technical Services - Computer/Environmental will coordinate all activities with the federal and state agencies under the direction of Staff.

EXHIBIT #2

Map of Intermountain Generating Station Site Petroleum
Tank (large and small scale)

Map of Intermountain Converter Station

Map of Intermountain Generating Station Site Oil/Water
Separators (large and small scale)

Map of DMAD Reservoir Pump Station Location

EXHIBIT #2

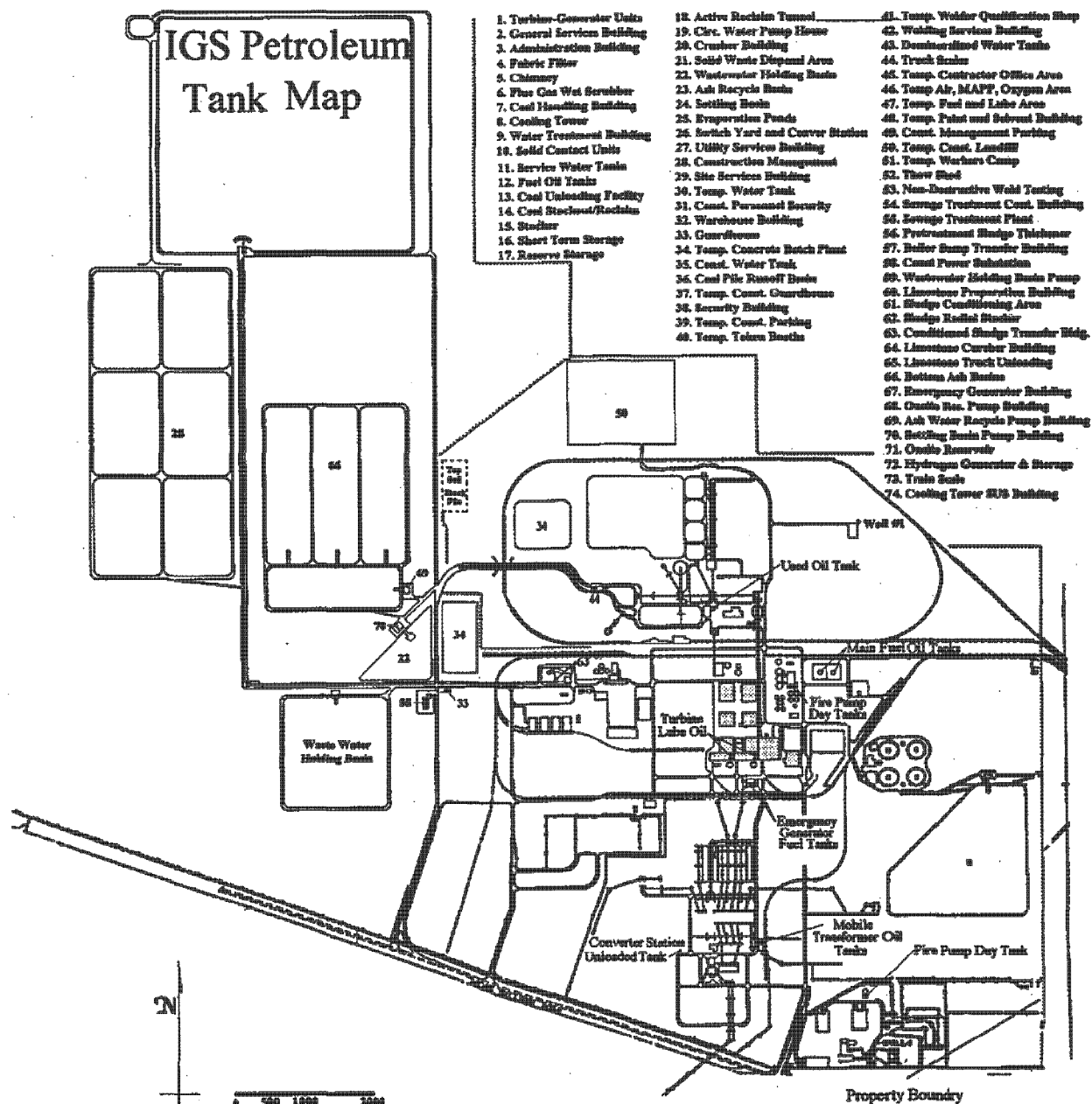


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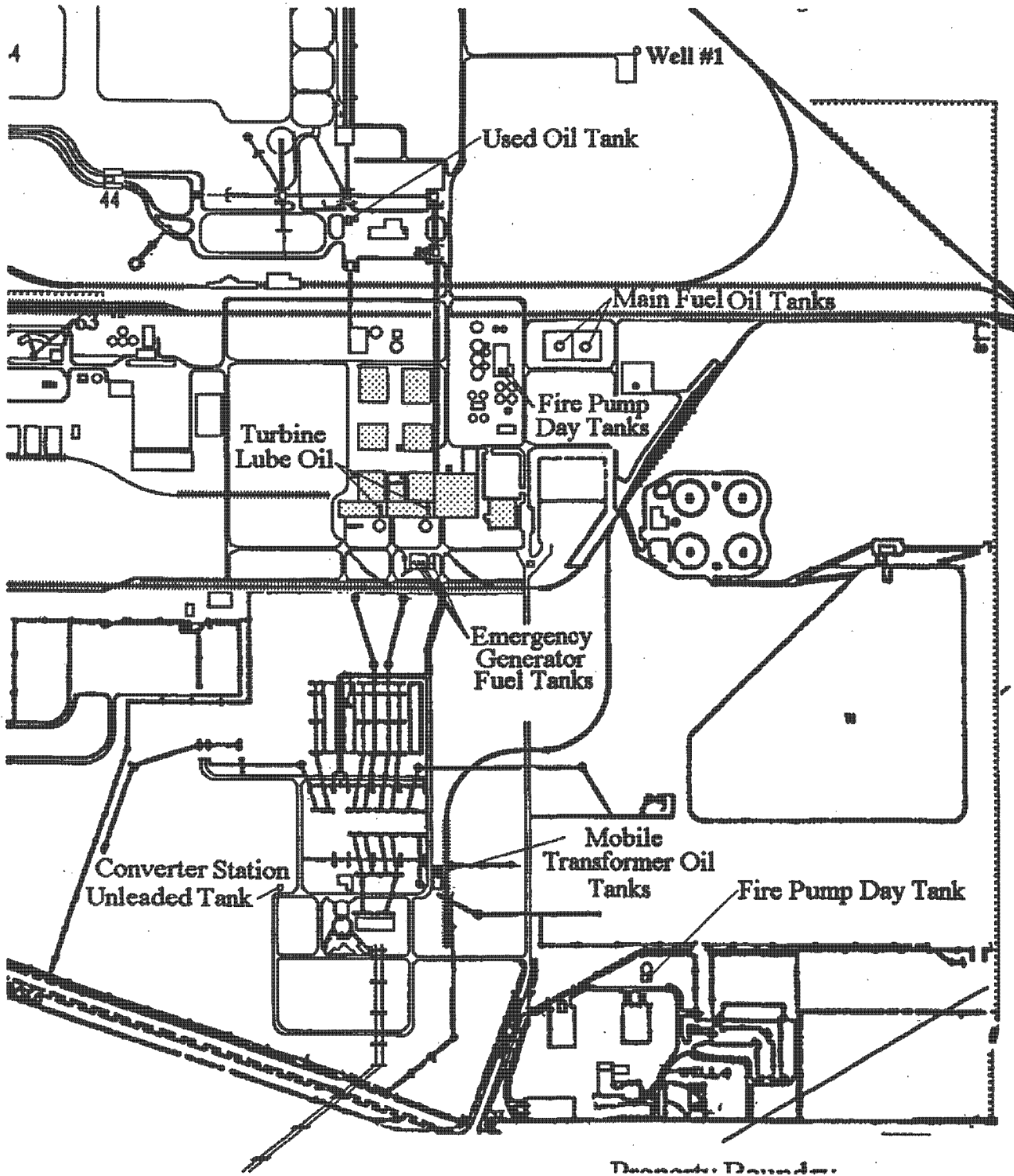
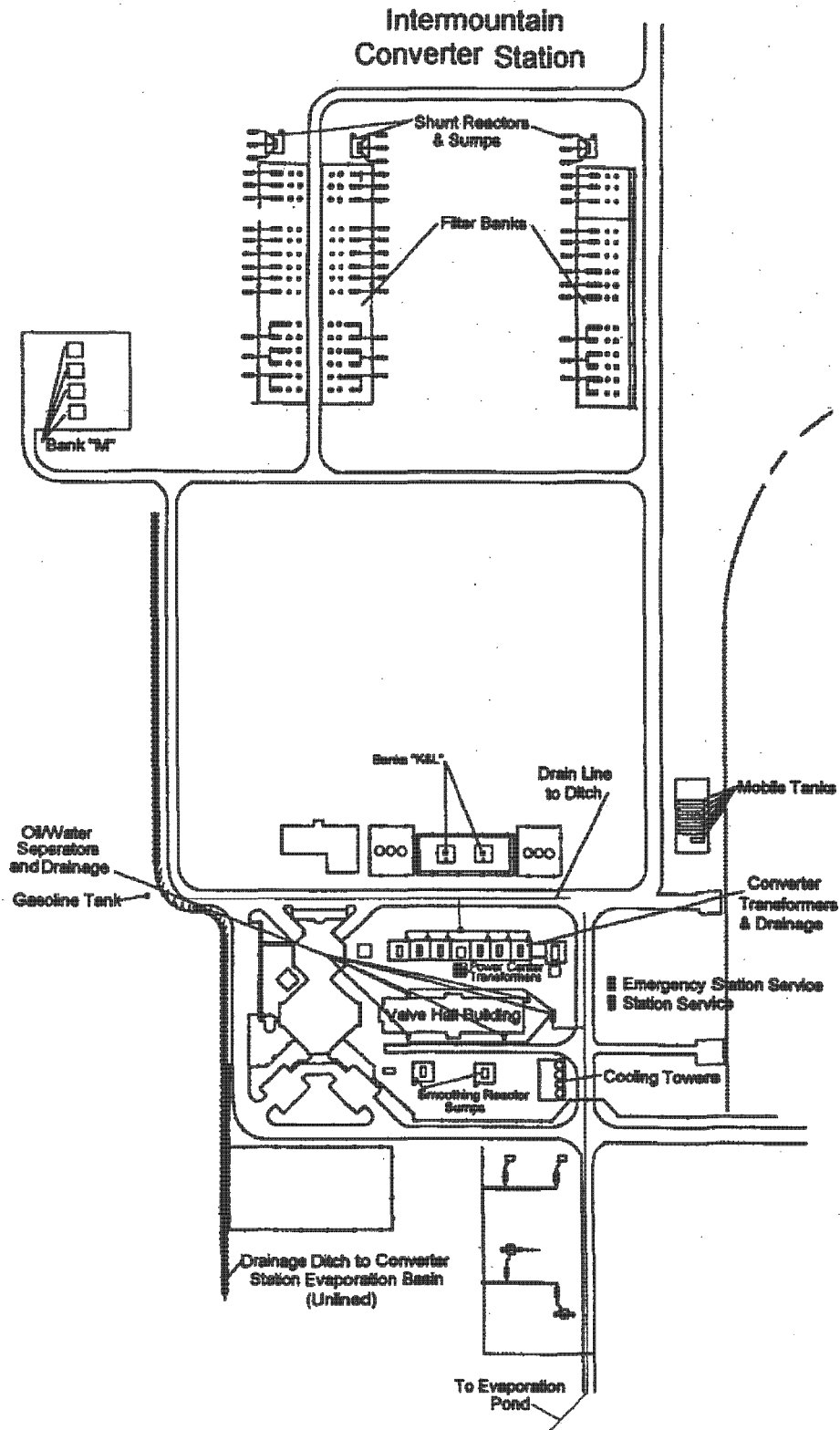


EXHIBIT #2



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EXHIBIT #2

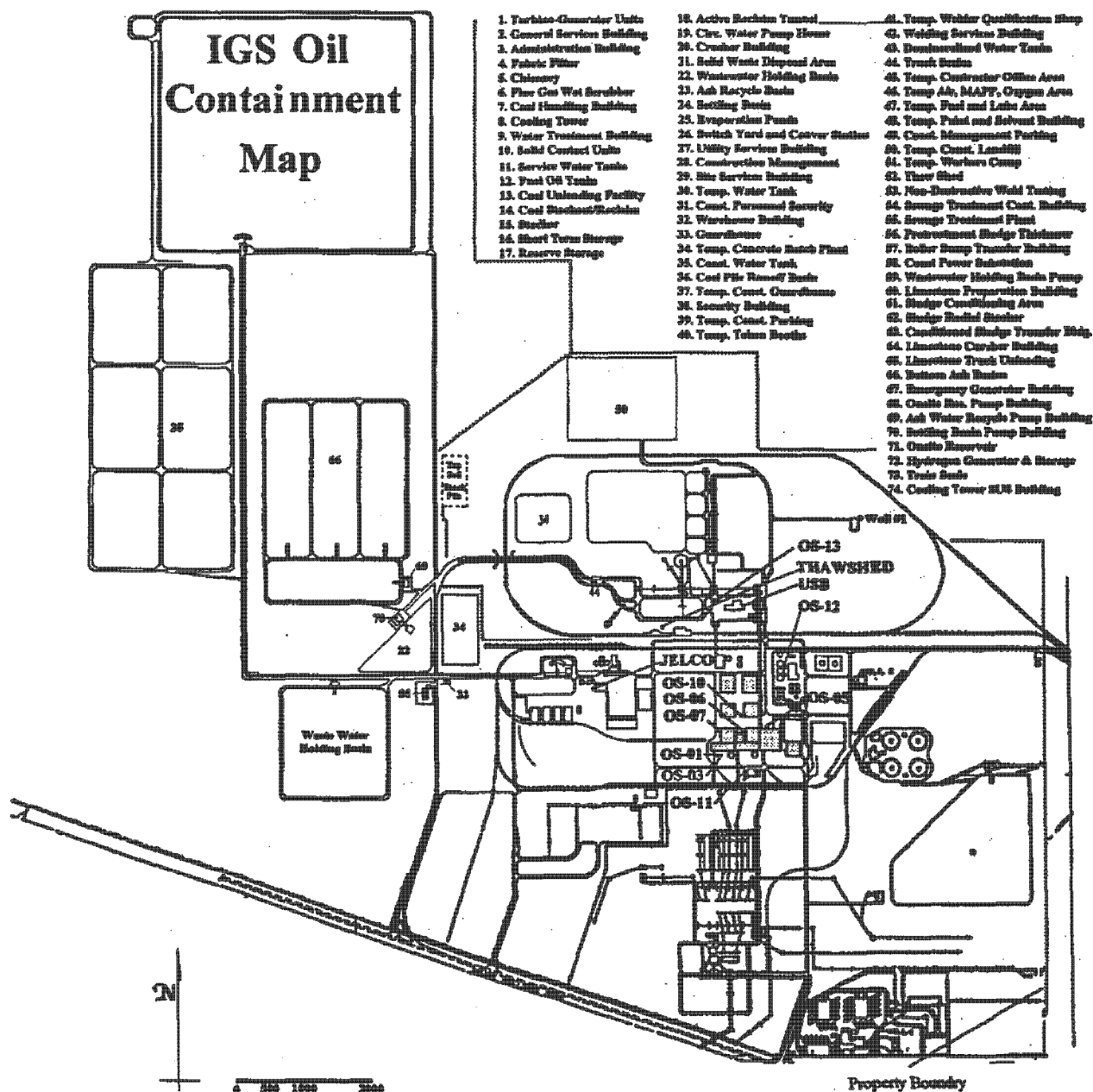


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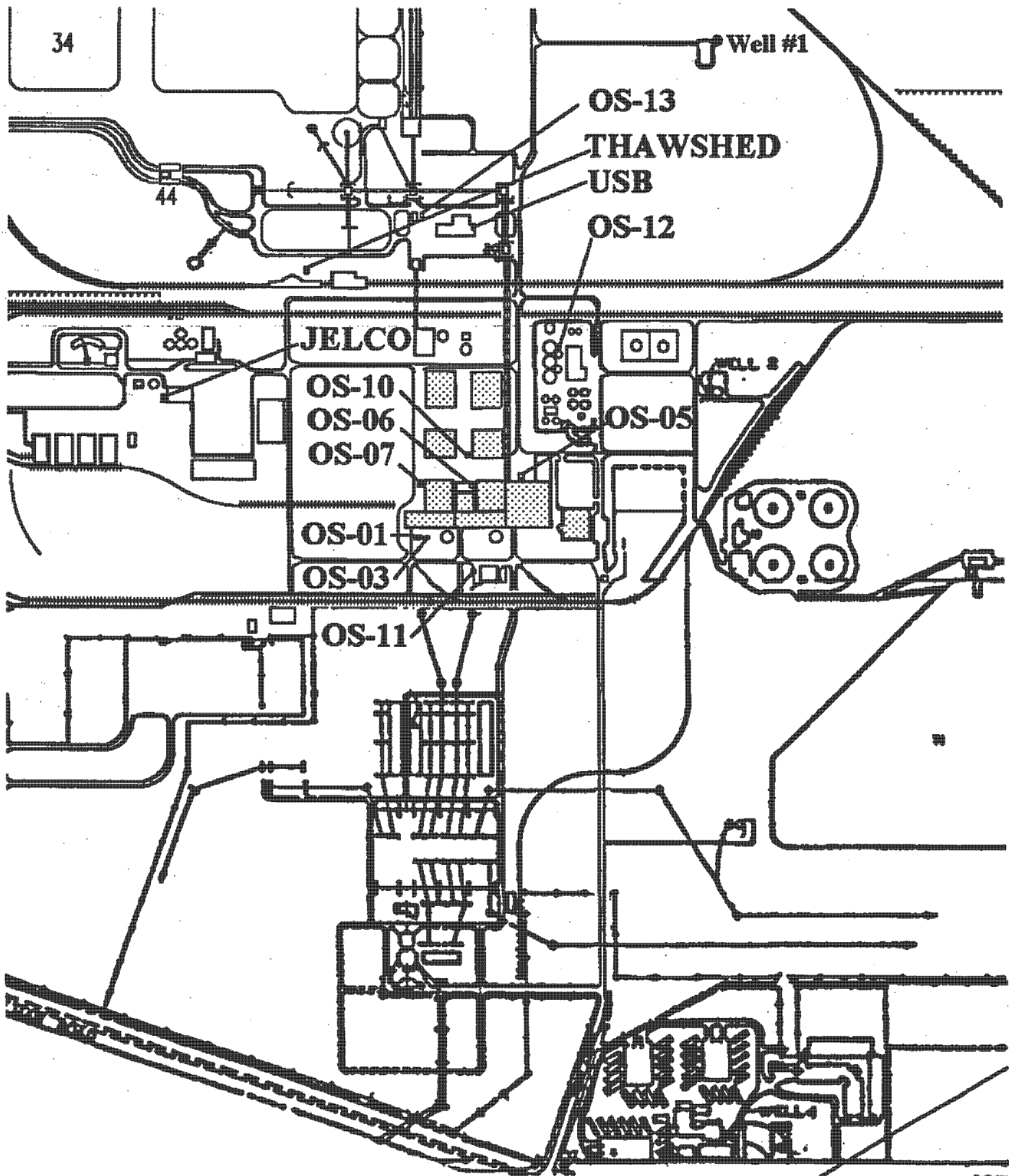


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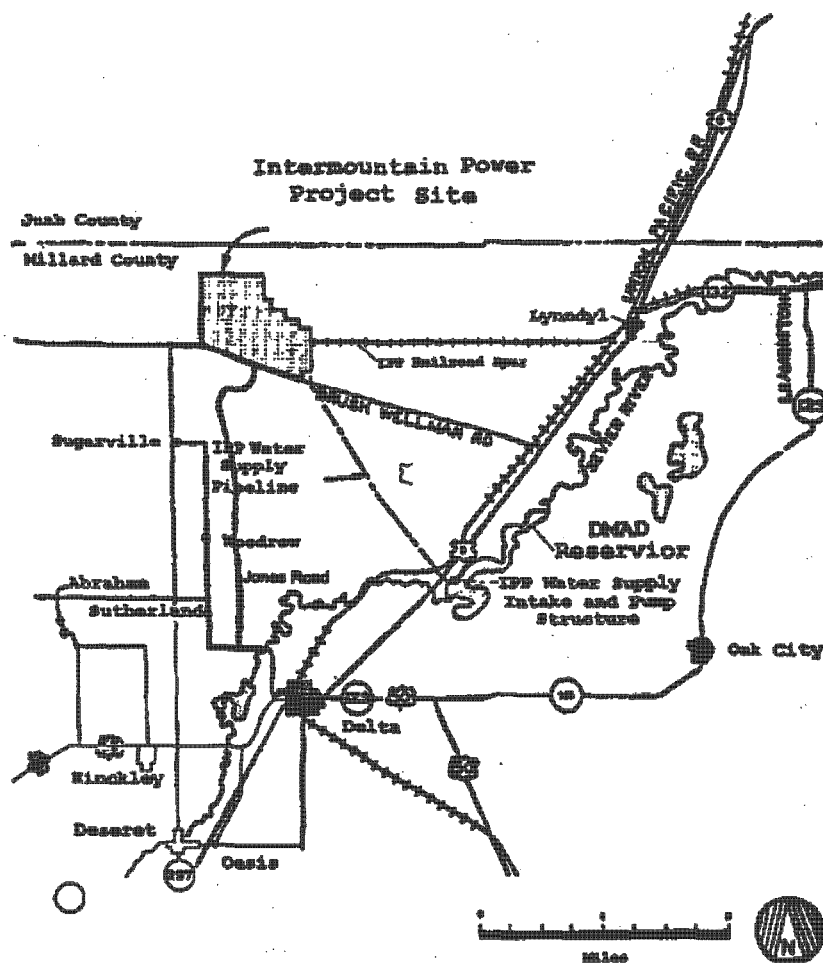


EXHIBIT #3

Oil Quantities (Equipment and Tanks) and ICS (Oil Filled Equipment)

Power Block, Electrical

<u>Equipment</u>	<u>Number (Each)</u>	<u>Quantity (Gallons)</u>	<u>Total (Quantity)</u>
Main Unit Transformers	3	28,000	84,000
Unit Auxiliary Transformers	5	5,800	29,000
Reserve Auxiliary Transformers	2	6,574	13,148
Thaw Shed Transformers	2	1,630	3,260
Ash Water Recycle Transformers	2	837	1,674
Construction Substation Transformer	1	1,123	1,123
Community Center Substation Transformer	1	1,123	1,123
Padmount at Weld Services	1	225	225
Padmount at Warehouse	1	400	400
Padmount at Warehouse	1	225	225
Padmount at Site Services	1	210	210
Padmount at CMOB	1	225	225
Padmount at Administration Building	1	401	401
Padmount at Wellpumps 1, 2, & 4	3	225	675
Padmount at Wellpump 3	1	200	200
Padmount at WWHB Pump Building	1	260	260
Padmount in Coalyard for Hot Water/Glycol Systems	1	225	225
Padmount at Sludge Transfer 3 & 4, & Sewage Treatment	3	155	465
Construction Padmounts Throughout the Site	5	400	2,000
Construction Padmounts Throughout the Site	16	225	3,600
Padmount for Environmental Equipment Along North	1	89	89
Oil Filled Padmount Switch Station for Construction	3	89	267
Padmounts Located at Community Center	21	89	1,869
Total			144,664

Power Block, Mechanical

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Acid Feed Pump Pulsafeeder	1
Acid Feed Pump Pulsafeeder	1
Air Preheat Water Pumps	2
Air Preheat Water Pumps	2
Ammonia Pumps, Pulsafeeder	2
Ammonia Pumps, Pulsafeeder	2
As Fired Sampler	3
As Fired Sampler	55
Atlas Copco Eagle Air Compressors	7
Atlas Copco Eagle Air Compressors	7
Auxiliary Boiler FD Fans	2
Auxiliary Boiler Hydrazine Pumps	2

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Auxiliary Boiler Phosphate Pumps	2
Boiler Feed Pump Turbine Lube Oil Centrifuge	1
Boiler Feed Pump Turbine Lube Oil Centrifuge	1
Booster Boiler Feed Pumps	78
Booster Boiler Feed Pumps	78
Bottom Ash Crusher	12
Bottom Ash Crusher	12
Bottom Ash Crusher	24
Bottom Ash Crusher	24
Bottom Ash Transfer Pumps	3
Bottom Ash Transfer Pumps	3
Caustic Feed Pumps, Pulsafeeder	16
Caustic Feed Pumps, Pulsafeeder	16
Circulating Water 2 Ton Hoist	1
Circulating Water Acid Pumps	2
Circulating Water Acid Pumps	2
Circulating Water Pumps	42
Circulating Water Pumps	42
Closed Cycle Cooling Water Pumps	4
Closed Cycle Cooling Water Pumps	4
Coagulant Feed Pumps	12
Coagulant Feed Pumps	24
Coal Car Dust Collectors	28
Coal Car Rotary Plows	220
Coal Conveyor	4
Coal Conveyor	100
Coal Conveyor 15A, 15B	4
Coal Conveyor 15A, 15B	4
Coal Conveyor 15A, 15B	6
Coal Conveyor 15A, 15B	52
Coal Conveyor 18A, 18B	4
Coal Conveyor 18A, 18B	6
Coal Conveyor 18A, 18B	140
Coal Conveyor 3	2
Coal Conveyor 3	14
Coal Conveyor 3	45
Coal Conveyor 3	115
Coal Conveyor 30	2
Coal Conveyor 30	2
Coal Conveyor 30	5
Coal Conveyor 30	55
Coal Conveyor 4	2
Coal Conveyor 4	2
Coal Conveyor 4	5
Coal Conveyor 4	55
Coal Conveyor 5A, 5B	4
Coal Conveyor 5A, 5B	14
Coal Conveyor 5A, 5B	180
Coal Conveyor 6	2
Coal Conveyor 6	50
Coal Conveyor 6	240
Coal Conveyor 8	3

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Coal Conveyor 8	5
Coal Conveyor 8	5
Coal Conveyor 8	74
Coal Conveyor 9A, 9B	36
Coal Conveyor 7	14
Coal Conveyor 7	45
Coal Conveyor 7	80
Coal Conveyors	52
Coal Conveyors	350
Coal Crusher	4
Coal Pulverizers	24
Coal Pulverizers	24
Coal Pulverizers	24
Coal Pulverizers	24
Coal Pulverizers	83
Coal Pulverizers	83
Coal Pulverizers	120
Coal Pulverizers	120
Coal Pulverizers	2,200
Coal Pulverizers	2,200
Coal Stacker	2
Coal Stacker	2
Coal Stacker	2
Coal Stacker	5
Coal Stacker	10
Coal Stacker	44
Coal Stacker	125
Combustion Gas Reheat Water Pumps	2
Combustion Gas Reheat Water Pumps	2
Condensate Polisher Recycle Pumps	2
Condensate Polisher Recycle Pumps	2
Condensate Pumps	183
Condensate Pumps	183
Conditioned Sludge Conveyor 4	5
Conditioned Sludge Conveyor 4	60
Conditioned Sludge Conveyor 5	5
Conditioned Sludge Conveyor 5	60
Control Building Booster Pump	1
Control Building Booster Pump	1
Control Building Chilled Water Pumps	2
Control Building Chilled Water Pumps	2
Control Building HVAC Hot Water Pumps	2
Control Building HVAC Hot Water Pumps	2
Cooling Tower Fans	312
Cooling Tower Fans	312
Cooling Tower Fans	312
Cooling Tower Fans	312
Demineralizer Caustic Pumps	32
Dust Collector Coal Crusher Building	7
Dust Collector Coal Truck Unloading and Reserve Reclaim	14
Dust Collector Coal Transfer 1	7
Dust Collector Coal Transfer 2	7

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Dust Collector Coal Transfer 4	7
Economizer Hopper Ash Crusher	4
Economizer Hopper Ash Crusher	4
Economizer Hopper Ash Crusher	8
Economizer Hopper Ash Crusher	8
FD Fan Hydraulic Oil Units	120
FD Fan Hydraulic Oil Units	120
FD Fan Lube Oil Units	120
FD Fan Lube Oil Units	120
Filter Feed Mixer	1
Filter Feed Mixer	50
Filter Feed Sump Mixer	8
Filtrate Sump Pump	5
Flocculent Feed Pumps	3
Generation Building HVAC Hot Water	2
Generation Building HVAC Hot Water	2
GSB HVAC Hot Water Booster Pump	1
GSB HVAC Hot Water Booster Pump	2
GSB Shop 20/5 Ton Hoist	2
GSB Shop 20/5 Ton Hoist	12
GSB Vacuum Cleaning Blower	2
High Pressure Drain Pumps	2
High Pressure Drain Pumps	2
Hydrazine Feed Pumps, Pulsafeeder	2
Hydrazine Feed Pumps, Pulsafeeder	2
ID Fan Lube Oil Unit	440
ID Fan Lube Oil Unit	440
Ignitor Booster Air Compressor	4
Ignitor Booster Air Compressor	4
Ignitor Booster Air Compressor	15
Ignitor Booster Air Compressor	15
Inhibitor Pump	2
Inhibitor Pump	2
Lime Silo Fill Blower	5
Lime Slurry Pump, Pulsafeeder	1
Lime Slurry Pump, Pulsafeeder	1
Lime Transfer Blower	5
Lime Unloading Exhauster	10
Limestone 20 Ton Crane	1
Limestone 20 Ton Crane	12
Limestone 7.5 Ton Crane	2
Limestone Conveyor	2
Limestone Conveyor 1	18
Limestone Conveyor 2	2
Limestone Conveyor 2	26
Limestone Conveyor 3	22
Limestone Conveyor 4	13
Limestone Conveyor 4	30
Limestone Pulverizers	3
Limestone Pulverizers	3
Limestone Pulverizers	75
Limestone Pulverizers	180

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Limestone Slurry Tank Mixers	110
Limestone Sump Mixer	3
Limestone Truck Unloading Feeder	10
Limestone Truck Unloading Feeder	25
Limiterque Operator Valve	9
Limiterque Operator Valve	9
Limiterque Operator Valve	1
Limiterque Operator Valve	1
Liquid Polymer Feed Pumps	4
Liquid Polymer Pump	1
Merrick Coal Feeders	8
Merrick Coal Feeders	8
Neutralization Basin Mixer	30
On-Site Reservoir 2 Ton Hoist	1
On-Site Reservoir Pumps	3
PA Fans	200
PA Fans	200
Phosphate Feed Pumps, Pulsafeeder	16
Phosphate Feed Pumps, Pulsafeeder	16
Pretreatment Overflow Pumps	1
Pretreatment Sludge Tank Mixer	35
Pretreatment Sludge Thickener Mixer	1
Pretreatment Sludge Thickener Mixer	4
Primary Air Heaters	8
Primary Air Heaters	8
Primary Air Heaters	10
Primary Air Heaters	10
Primary Air Heaters	26
Primary Air Heaters	26
Pug Mills	4
Pug Mills	10
Pug Mills	100
Reaction Tank Mixers	300
Reaction Tank Mixers	300
Redler Coal Conveyors	70
Redler Coal Conveyors	160
Redler Coal Conveyors	320
Redler Coal Conveyors	320
Reservoir - Unit 1 BFP Turbine Lube Oil 1A	700
Reservoir - Unit 1 BFP Turbine Lube Oil 1B	700
Reservoir - Unit 2 BFP Turbine Lube Oil 1A	700
Reservoir - Unit 2 BFP Turbine Lube Oil 1B	700
Reservoir - Unit 1 Turbine Lube Oil	8,550
Reservoir - Unit 2 Turbine Lube Oil	8,550
Reverse Air Fans	12
Reverse Air Fans	12
Rotary Plows	220
Scrubber Makeup Pumps	2
Scrubber Spray Pumps	144
Scrubber Spray Pumps	144
Scrubber Sump Mixers	16
Scrubber Sump Mixers	16

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Seal Oil Vacuum Pump	1
Seal Oil Vacuum Pump	1
Seal Water Pump	1
Seal Water Pumps	2
Seal Water Pumps	2
Secondary Air Heaters	4
Secondary Air Heaters	4
Secondary Air Heaters	6
Secondary Air Heaters	6
Secondary Air Heaters	28
Secondary Air Heaters	28
Secondary Air Heaters	80
Secondary Air Heaters	80
Secondary Air Heaters	170
Secondary Air Heaters	170
Service Air Compressor	300
Settling Basin 1.5 Ton Hoist	1
Settling Basin Pump House 3 Ton Crane	2
Sewage Treatment Comminuter	1
Sludge Conditioning 1 Ton Jib Hoist	1
Sludge Conditioning 1 Ton Silo Roof Enclosure Hoist	1
Sludge Conditioning 12.5 Ton Hoist	6
Sludge Conditioning 5 Ton Hoist	1
Sludge Conveyor	1
Sludge Conveyor	1
Sludge Conveyor	4
Sludge Conveyor	25
Sludge Conveyor	50
Sludge Dust Collector	2
Sludge Dust Collector	10
Sludge Emergency Radial Stacker 1	4
Sludge Emergency Radial Stacker 1	20
Sludge Emergency Radial Stacker 1	30
Sludge Radial Stacker 2	4
Sludge Radial Stacker 2	20
Sludge Radial Stacker 2	30
Sludge Shuttle	8
Sludge Shuttle	9
Sludge Thickener Rake Drive	3
Sludge Thickener Rake Drive	9
Sludge Thickener Rake Drive	9
Sludge Thickener Rake Drive	35
Sludge Transfer Building 2.5 Ton Hoist	1
Soda Ash Tank Feeder Speed Reducers	1
Soda Ash Tank Feeder Speed Reducers	1
Soda Ash Tank Silo Feeder	1
Sodium Hypochlorite Solution Pump	4
Solid Contact Units	12
Solid Contact Units	12
Solid Contact Units	15
Solid Contact Units	15
Soot Blowers	4
Soot Blowers	4

<u>Equipment</u>	<u>Quantity (Gallons)</u>
Soot Blowers	10
Soot Blowers	10
Soot Blowers	14
Soot Blowers	14
Soot Blowers	25
Soot Blowers	25
Soot Blowers	6
Soot Blowers	6
Soot Blowers	8
Soot Blowers	8
Standby Boiler Feedpump 1C	275
Standby Boiler Feedpump 1C	275
Sump Mixer	5
Telescoping Chute	9
Thickener Feed Mixer	25
Train as Received Sampling System	24
Train as Received Sampling System	110
Truck as Received Sampler	110
Turbine Lube Oil Centrifuge	1
Turbine Lube Oil Centrifuge	1
USB 20 Ton Crane	1
USB 20 Ton Crane	12
USB Machine Shop 10 Ton Crane	8
Volumetric Feeder	1
Well Pumps	25
Total	36,464

DMAD Pump House

<u>Equipment</u>	<u>Number (Each)</u>	<u>Quantity (Gallons)</u>	<u>Total (Quantity)</u>
DMAD Distribution Transformer	1	807	807
DMAD Low Voltage Padmount	1	115	115
DMAD Reservoir Intake Pump	1	12	12
Total			934

AC Switch Yard

<u>Equipment</u>	<u>Number (Each)</u>	<u>Quantity (Gallons)</u>	<u>Total (Quantity)</u>
Transformers - M Rack	4	22,665	90,660
Transformers - Banks K & L	2	9,642	19,284
Transformers - Relay House Station Service	2	429	858
Transformers - Converter Station Service	2	927	1,854
Transformers - Converter Station Emergency Station Service	2	449	898
Current Transformers	106	38	4028
Total			117,582

Converter Station

<u>Equipment</u>	<u>Number (Each)</u>	<u>Quantity (Gallons)</u>	<u>Total (Quantity)</u>
Converter Transformers	7	28,270	197,890
Smoothing Reactors	3	11,564	34,692
Shunt Reactors	3	10,324	30,972
Transformers	2	927	1,854
Transformers	2	449	898
Wall Bushings	11	340	3,740
Wall Bushings	8	325	2,600
Wall Bushings	3	40	120
DC Transducers	7	325	2,275
DC Transducers	8	150	1,200
Voltage Dividers	9	55	495
Total			276,736

Oil Filled Equipment

<u>Equipment</u>	<u>Total (Quantity)</u>
Power Block - Electrical	144,664
Power Block - Mechanical	36,464
DMAD	934
AC Switch Yard	113,554
Converter Station	280,764
Total	576,380

Oil and Fuel Oil Tank Capacities

<u>Equipment</u>	<u>Number (Each)</u>	<u>Quantity (Gallons)</u>	<u>Total Quantity</u>
Main Fuel Oil Storage Tank	2	675,000	1,350,000
Emergency Generator Fuel Tank	1	11,105	11,105
Emergency Generator Day Tank	3	560	1,680
Emergency Fire Pump Day Tank	2	280	560
Emergency Fire Pump Day Tank (Construction)	2	180	360
Waste Oil Tank	1	10,057	10,057
Turbine Lube Oil Tank	4	16,000	64,000
ICS Mobile Oil Storage Tanks	5	12,000	60,000
ICS Mobile Oil Storage Tank	1	5,000	5,000
Contractor Area Gasoline Tanks	1	500	500
Total			1,503,262

Grand Total **2,079,642**

EXHIBIT #4

Oil Spill Events at Intermountain Generating Station

Event Occurring in April 1991:

IPSC experienced an oil spill in April 1991 that resulted in contamination of an on-site pond. It is unclear whether or not this oil spill can be construed to have been on the "Waters of the United States." If indeed this spill was on "Waters of the United States," the law requires that a summary of the event be included in the SPCC Plan. Therefore, to satisfy this requirement in case this spill was on "Waters of the United States," the events surrounding this spill, as well as the steps taken to mitigate and prevent any future recurrence, will be summarized below.

During the April 1991 routine outage for maintenance work on Unit 1, some oil got on the Settling Basin Pond. It was estimated that the total quantity of oil was about 75 gallons. This oil was a light lubricating type of oil. It was never positively verified where the oil came from, but undoubtedly, it came through one of the plant drain systems and the ditch which goes into the Settling Basin.

The oil on the Settling Basin was discovered after an IPSC employee discovered a grebe (a type of water fowl bird) walking around on one of the plant roads near the Settling Basin. This grebe was covered with oil. Further investigation showed there was some oil on the Settling Basin and more birds were covered with oil and unable to fly. The State Division of Wildlife, U.S. Fish and Wildlife Services, and the local Central Utah Health District were all notified.

Under the direction of the U.S. Fish & Wildlife and the State Division of Wildlife people, additional birds were rescued and cleanup was completed. In all, 26 grebes died from being covered with oil. The oil damaged the down on their bodies so that it did not repel water, which caused the birds to get cold, so they actually died from hypothermia.

As a result of this incident, IPSC initiated several changes including engineering controls, procedures, and training to prevent another spill.

1. Engineering designed an oil skimming weir for the ditch leading to the Settling Basin. This weir was installed by mid-May of 1991, and is now in use.
2. IPSC also purchased two propane cannons in 1991 which are now available for use whenever needed.
3. Planning has programmed work orders to be sent to the Environmental Group to check key oil/water separators before each outage. When the plant is taken off line for outage, many systems are concurrently drained. Systems such as water boxes and circulating water piping, boilers, and feed water heaters contain large amounts of water. This water can cause turbulence in the oil/water separators when it is drained at high volumes over many hours. If the water flows fast enough to cause turbulence in the oil/water separators, and the separators contain significant quantities of oil, then it can mix with the water and escape to the ponds.
4. This PAI on the SPCC Plan (PAI #101) was also reviewed and updated after the above discussed incident.

If, despite all of these precautions another oil spill occurs, IPSC will be more prepared to characterize and mitigate any damage that might occur by following the procedures outlined in the SPCC and OSCP in this PAI, in particular the decision tree in Exhibit #10.

EXHIBIT #5

Containment Capacities

Tank	Quantity	Spill Protection Capacity
Main Fuel Oil Storage Tank - East	675,000	High density polyethylene-lined earthen structure. Volume= $((155'155'6)+4'(0.5'18.9'((190+155)/2)'6))-(95'95'4))'$ 7.48=1,100,854 gallons: Spill would flow to settling basin.
Main Fuel Oil Storage Tank - West	675,000	High density polyethylene-lined earthen structure. Volume= $((155'155'6)+4'(0.5'18.9'((190+155)/2)'6))-(95'95'4))'$ 7.48=1,100,854 gallons: Spill would flow to settling basin.
Emergency Generator Fuel Tank	11,105	Contained in a concrete basin ((45x15x3)-(4x8x2.8x3 (tank support pads))-(1.8x4x2.8x3(pump motor pads)))x7.48=12,683 gallons: Spill would flow to the storm water runoff ditch.
Emergency Generator Day Tank - A	560	Oil Water Separator OS-11, 1,400 gallons (figure taken from B&V system description of Wastewater Collection and Treatment, pages 3-5): Spill would flow to the settling basin.
Emergency Generator Day Tank - B	560	Oil Water Separator OS-11, 1,400 gallons (figure taken from B&V system description of Wastewater Collection and Treatment, pages 3-5): Spill would flow to the settling basin.
Emergency Generator Day Tank - C	560	Oil Water Separator OS-11, 1,400 gallons (figure taken from B&V system description of Wastewater Collection and Treatment, pages 3-5): Spill would flow to the settling basin.
Emergency Fire Pump Day Tank ("B" at WT)	280	Oil Water Separator OS-12, 750 gallons (figure taken from B&V system description of Wastewater Collection and Treatment, pages 3-5): Spill would flow to the settling basin.
Emergency Fire Pump Day Tank ("C" at WT)	280	See Emergency Fire Pump Day Tank ("B" at WT).
Emergency Fire Pump Day Tank (Man Camp)	180	No Oil Water Separators or containment: Spill would flow to the storm water runoff ditch.
Emergency Fire Pump Day Tank (Site Services)	180	Unnamed Oil Water Separator of undetermined capacity. Spill would flow to the settling basin. Emergency Fire Pump System is inactive and has been since 1992.
Waste Oil Tank	10,057	Oil Water Separator OS-13 Capacity= $40'13'(6.25-2.75)'48=$ 3,613.6 gallons, B&V Drawing 9-BSM-S5807, Section 4, and the main drawing on this sheet. Spill would flow to the coal pile runoff basin.
Turbine Lube Oil Tank (Unit 1 "A")	16,000	Oil Water Separator OS-3, 15,500 gallons (figure taken from B&V system description of Wastewater Collection and Treatment, pages 3-5): Spill would flow to the settling basin.
Turbine Lube Oil Tank (Unit 1 "B")	16,000	See Turbine Lube Oil Tank (Unit 1 "A") Oil Water Separator OS-3, 15,500 gallons.
Turbine Lube Oil Tank (Unit 2 "A")	16,000	See Turbine Lube Oil Tank (Unit 1 "A") Oil Water Separator OS-3, 15,500 gallons.
Turbine Lube Oil Tank (Unit 2 "B")	16,000	See Turbine Lube Oil Tank (Unit 1 "A") Oil Water Separator OS-3, 15,500 gallons.
ICS Mobile Oil Storage Tank #1	5,000	Tanks are normally located in a containment area. When they are moved to an outlying location they are in active service with an IPSC employee or contractor nearby.
ICS Mobile Oil Storage Tank #2	12,000	Please refer to ICS Mobile Oil Storage Tank #1.
ICS Mobile Oil Storage Tank #3	12,000	Please refer to ICS Mobile Oil Storage Tank #1.
ICS Mobile Oil Storage Tank #4	12,000	Please refer to ICS Mobile Oil Storage Tank #1.
ICS Mobile Oil Storage Tank #5	12,000	Please refer to ICS Mobile Oil Storage Tank #1.
ICS Mobile Oil Storage Tank #6	12,000	Please refer to ICS Mobile Oil Storage Tank #1.
Converter Station Gasoline Tank	500	Concrete containment basin >670 gallon capacity.
Total	1,503,262	

EXHIBIT #6

Oil/Water Separator Locations and Capacities

IPSC SPCC Oil Separator Inspections

Oil Separator	Physical Location	Capacity (Gallons)
OS-1	Located approximately 160 feet west of the Unit 2 condensate storage tank on the south side of the unit.	47,000
OS-3	Located immediately to the east of OS-1, and about 115 feet west of Unit 2 condensate tank.	15,500
OS-5	Located approximately 100 feet west of GSB dumpster.	3,000
OS-6	Located approximately 100 feet south of the northwest corner of Unit 1 Building.	3,000
OS-7	Located approximately 100 feet south of the northwest corner of Unit 2 Building.	3,000
OS-10	Located at the southwest corner of Unit 1 Fabric Filter Building.	
OS-11	Located approximately 20 feet west of the northeast corner of Emergency Generator Building.	1,400
OS-12	Located about 30 feet west of the northwest corner of Water Treatment Building.	750
OS-13	Located about 10 feet east of the waste oil tank by Hazardous Waste Building.	13,000
Thaw Shed	Located about 30 feet east of the northeast corner of the control area of the thaw shed - north side.	
USB	Located in the northeast corner of USB wash bay.	
Jelco	Located off the south west corner (75') of the Site Services Building.	

EXHIBIT #7

Tank Construction Standards

Tank	Quantity	Specification Standard
Main Fuel Oil Storage Tank	675,000	
Main Fuel Oil Storage Tank	675,000	
Emergency Generator Fuel Tank	11,105	Code Requirements: Latest Hydraulic Institute, AGMA, ANSI, ASTM, NFPA, DMEA, NEMA, IEEE, and OSHA standards - See Contract Document # 1882 Page 2A-3.
Emergency Generator Day Tank - A	560	See Emergency Generator Fuel Tank.
Emergency Generator Day Tank - B	560	See Emergency Generator Fuel Tank.
Emergency Generator Day Tank - C	560	See Emergency Generator Fuel Tank.
Emergency Fire Pump Day Tank ("B" at WT)	280	Code Requirements: Latest Effective AFBMA, ANSI, ASTM, FM, HI, ICEA, IEEE, ISA, MSS, NBFU, NEC, NEMA, NESC, NFPA, NIMA, OSHA, SSPC, TEMA, UBC, UL. See Contract Document #1923 Pages 1B-1,2.
Emergency Fire Pump Day Tank ("C" at WT)	280	See Emergency Fire Pump Day Tank ("B" at WT).
Emergency Fire Pump Day Tank (Construction)	180	See Emergency Fire Pump Day Tank ("B" at WT).
Emergency Fire Pump Day Tank (Site Services)	180	See Emergency Fire Pump Day Tank ("B" at WT).
Waste Oil Tank	10,057	
Turbine Lube Oil Tank (Unit 1 "A")	16,000	Welding: Must meet UL Standard 142; Division 1, Section VIII, Section IX, Section 1C, of the ASME Boiler and Pressure Vessel Code; Paragraph 4.5.2 AWS D1.1 Flange Bolting: ANSI B16.5, ASTM A193 Grade B7, ANSI B18.2, ASTM A194 Grade 2H. Testing: Tested per UL 142, no UL stamp attached. Seismic Classification: E-1 Performance Level "Good". Other Specifications are found in contract book #1952: Shop Fabricated Tanks- Atmospheric.
Turbine Lube Oil Tank (Unit 1 "B")	16,000	See Turbine Lube Oil Tank (Unit 1 "A").
Turbine Lube Oil Tank (Unit 2 "A")	16,000	See Turbine Lube Oil Tank (Unit 1 "A").
Turbine Lube Oil Tank (Unit 2 "B")	16,000	See Turbine Lube Oil Tank (Unit 1 "A").
ICS Mobile Oil Storage Tank #1	5,000	No Specification Documentation is Available.
ICS Mobile Oil Storage Tank #2	12,000	No Specification Documentation is Available.
ICS Mobile Oil Storage Tank #3	12,000	No Specification Documentation is Available.
ICS Mobile Oil Storage Tank #4	12,000	No Specification Documentation is Available.
ICS Mobile Oil Storage Tank #5	12,000	No Specification Documentation is Available.
ICS Mobile Oil Storage Tank #6	12,000	No Specification Documentation is Available.
Converter Station Gasoline Tank	500	No Specification Documentation is Available.
Total	1,503,262	

EXHIBIT #8

Tank Equipment Comparisons

	Quantity (Gallons)	Gauge	High Alarm	Cathodic Protection	Secondary Containment	Oil-Water Separator	Drain Locks	UL/API Stamp	Ground
Main Fuel Oil Storage Tank	675,000	Yes	No	No	Yes	No	No	No	Yes
Main Fuel Oil Storage Tank	675,000	Yes	No	No	Yes	No	No	No	Yes
Emergency Generator Fuel Tank	11,105	Yes	No	No	Yes	No	No	No	Yes
Emergency Generator Day Tank - A	560	Yes	No	No	No	Yes	No	UL	Yes
Emergency Generator Day Tank - B	560	Yes	No	No	No	Yes	No	UL	Yes
Emergency Generator Day Tank - C	560	Yes	No	No	No	Yes	No	UL	Yes
Emergency Fire Pump Day Tank ("B" at WT)	280	Yes	No	No	No	Yes	No	UL	Yes
Emergency Fire Pump Day Tank ("C" at WT)	280	Yes	No	No	No	Yes	No	UL	Yes
Emergency Fire Pump Day Tank (Construction)	180	Yes	No	No	No	No	No	No	Yes
Emergency Fire Pump Day Tank (Site Services)	180	Yes	No	No	No	Yes	No	No	Yes
Waste Oil Tank	10,057	Yes	No	No	No	Yes	No	No	Yes
Turbine Lube Oil Tank (Unit 1 "A")	16,000	Yes	No	No	Yes	Yes	No	No	
Turbine Lube Oil Tank (Unit 1 "B")	16,000	Yes	No	No	Yes	Yes	No	No	
Turbine Lube Oil Tank (Unit 2 "A")	16,000	Yes	No	No	Yes	Yes	No	No	
Turbine Lube Oil Tank (Unit 2 "B")	16,000	Yes	No	No	Yes	Yes	No	No	
ICS Mobile Oil Storage Tank #1	5,000	Yes	No	No	No	No	No		In Use
ICS Mobile Oil Storage Tank #2	12,000	Yes	No	No	No	No	No		In Use
ICS Mobile Oil Storage Tank #3	12,000	Yes	No	No	No	No	No		In Use
ICS Mobile Oil Storage Tank #4	12,000	Yes	No	No	No	No	No		In Use
ICS Mobile Oil Storage Tank #5	12,000	Yes	No	No	No	No	No		In Use
ICS Mobile Oil Storage Tank #6	12,000	Yes	No	No	No	No	No		In Use
Converter Station Gasoline Tank	500	Yes	No	No	Yes	No	No		Yes
Total	1,503,262								

EXHIBIT #9

Facility Inspection Check Sheet

	Quantity (Gallons)	Gauge OK	Secondary Containment No Oil	Drain Locks Present	Inlet Piping OK	Outlet Piping OK	Comments
Main Fuel Oil Storage Tank "A"	675,000						
Main Fuel Oil Storage Tank "B"	675,000						
Emergency Generator Fuel Tank	11,105						
Emergency Generator Day Tank A	560						
Emergency Generator Day Tank B	560						
Emergency Generator Day Tank C	560						
Emergency Fire Pump Day Tank ("B")	280						(Water Treatment)
Emergency Fire Pump Day Tank ("C")	280						(Water Treatment)
Emergency Fire Pump Day Tank	180						(Construction)
Emergency Fire Pump Day Tank	180						(Site Services)
Waste Oil Tank	10,057						
Turbine Lube Oil Tank (Unit 1 "A")	16,000						
Turbine Lube Oil Tank (Unit 1 "B")	16,000						
Turbine Lube Oil Tank (Unit 2 "A")	16,000						
Turbine Lube Oil Tank (Unit 2 "B")	16,000						
ICS Mobile Oil Storage Tank #1	5,000						
ICS Mobile Oil Storage Tank #2	12,000						
ICS Mobile Oil Storage Tank #3	12,000						
ICS Mobile Oil Storage Tank #4	12,000						
ICS Mobile Oil Storage Tank #5	12,000						
ICS Mobile Oil Storage Tank #6	12,000						
Converter Station Gasoline Tank	500						
Total	1,503,262						

Oil/Water Separator Inspection Sheet

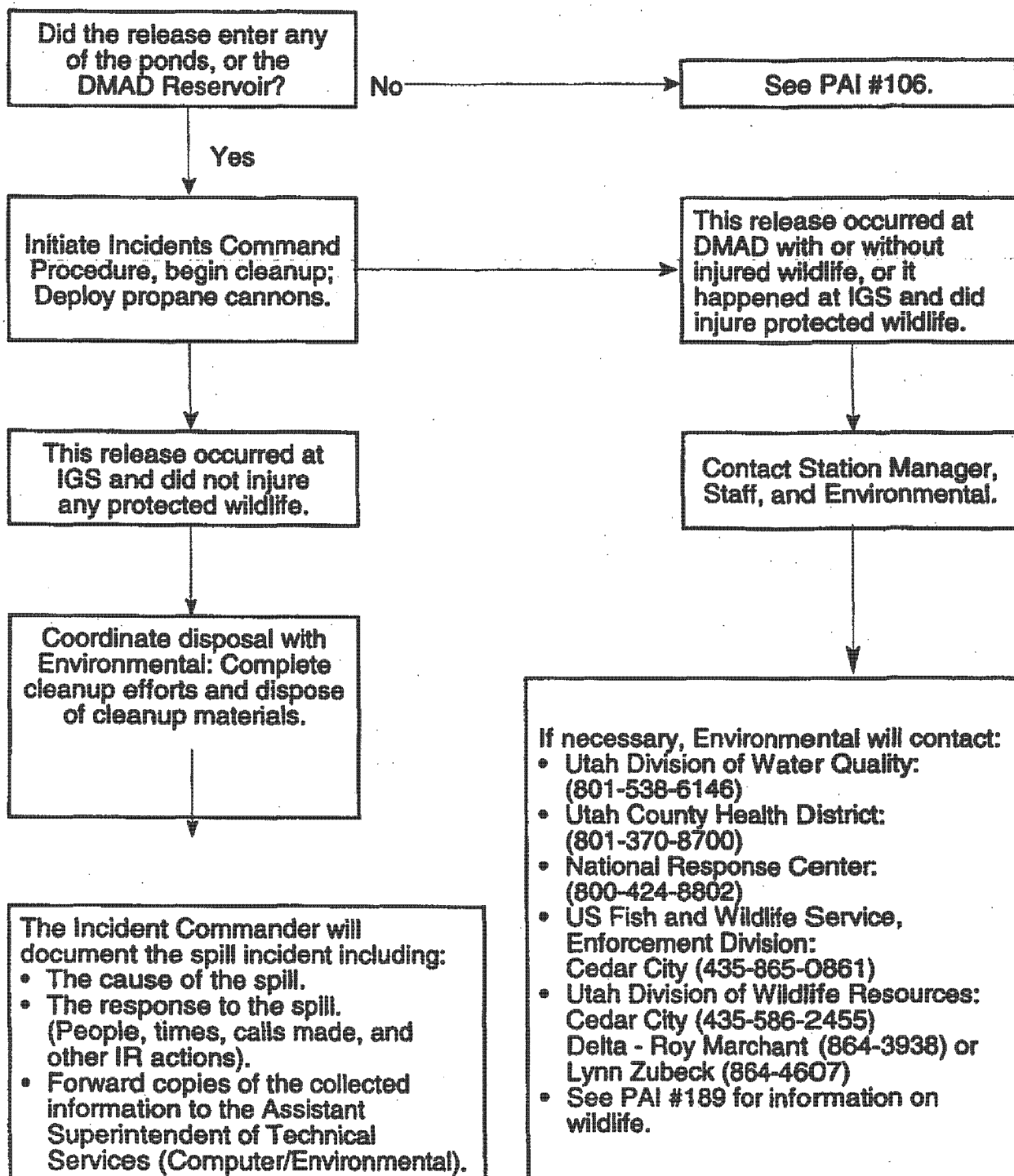
	Inches - Oil	Structure OK	Comments
Oil/Water Separator #1 (OS - 1)			
Oil/Water Separator #3 (OS - 3)			
Oil/Water Separator #5 (OS - 5)			
Oil/Water Separator #6 (OS - 6)			
Oil/Water Separator #1 Construction (Jelco)			
Oil/Water Separator #7 (OS - 7)			
Oil/Water Separator #10 (OS - 10)			
Oil/Water Separator #11 (OS - 11)			
Oil/Water Separator #12 (OS - 12)			
Oil/Water Separator #13 (OS - 13)			
Thaw Shed			
USB			

I have inspected these structures and this sheet reflects the conditions that I found to be present.

Date:

IP7012023

EXHIBIT #10
IGS Oil Spill Decision Tree



INTERMOUNTAIN POWER SERVICE CORPORATION

PLANT ADMINISTRATIVE INSTRUCTION

HAZARDOUS MATERIALS AND WASTES
MANAGEMENT PROCEDURES AND CONTINGENCY PLAN
TITLE

PAI #106
NUMBER

4
REVISION NO.

Rand Crafts
REVISED BY

Dennis K. Killian
APPROVED BY

S. Gale Chapman
PLANT MANAGER

6/17/99
DATE

Craig Lucy/Garth Block/Ken Lebbon
ORIGINAL BY

11/27/89
DATE

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EXHIBITS

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Exhibit #2	List of Emergency Response Personnel and Resources

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PLANT ADMINISTRATIVE INSTRUCTION

1.0 Title

HAZARDOUS MATERIALS AND WASTES MANAGEMENT PROCEDURES AND CONTINGENCY PLAN

2.0 Purpose

This Hazardous Material and Waste Management PAI provides the user with general guidelines for safely and properly managing hazardous and potentially hazardous materials, chemicals, substances, or wastes. It is intended to establish consistency in the management of such substances among IPSC personnel. Many products purchased or generated by IPSC contain hazardous materials. Hazardous materials are substances at quantities which may pose a physical hazard, (such as a fire or explosion) or which may threaten human health or the environment. The effects of hazardous materials can be immediate or delayed, can be short-term or long-term, and can range in severity, depending on factors such as material, total quantity, and dosage rate.

In broad terms, this PAI was written to:

- Present uniform and adequate information to train employees on how to protect themselves from exposure to, or the harmful effects of hazardous substances.
- Ensure that those IPSC functions involving hazardous substances will comply with governmental regulations.
- Provide general instructions and procedures for IPSC pertaining to hazardous materials/waste, including its generation, storage, transportation, disposal or recycling, and spill containment and cleanup.
- Meet regulatory requirements under the Resource Conservation and Recovery Act as mandated for large quantity generators of hazardous waste.
 - Provide a framework to comply with Risk Management Planning and Community Right-to-Know requirements for emergencies.

3.0 Scope

The provisions of this PAI apply to all IPSC personnel who are involved with the management and/or handling of hazardous materials and wastes. This instruction applies to the Intermountain Generating Station (IGS), Intermountain Converter Station (ICS), and, with the exception of the Hazardous Waste Contingency Plan and Risk Management (Section 5), Intermountain Railcar (IR).

The Intermountain Power Facilities described above function through:

Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624-9546
(435) 864-4414 (24 hours)

4.0 Guidelines and Procedures

4.1 Hazardous Material Use and Storage

4.1.1 Purchase

The purchase of and control of Hazardous Materials is covered in PAI #144 ("Minimization and Control of Hazardous Material and Waste").

4.1.2 Storage

Large quantities of ammonia, fuel oil, quick lime, sodium hydroxide, ferric sulfate, sulfuric acid, and cooling water inhibitor chemicals are stored in above ground tanks with spill containment included. Chlorine gas is stored in semi-portable one-ton and 150 pound cylinders. Unleaded gasoline and diesel fuel are stored in underground tanks. Hydrazine (35 percent) is sometimes stored in 30-gallon drums and 300-gallon mini-bins while a diluted solution is stored in above ground plastic tanks. Safety Kleen cleaning solvent is stored in 20-gallon and 30-gallon washers. The chemical laboratories store small quantities of miscellaneous hazardous substances. Oil is stored in large quantities at the Lube Oil Storage Building and Converter Station.

A large number of hazardous materials are stored in warehouse areas and at the Waste Treatment Building. Although unit quantity of each item is small, the aggregate stock of hazardous material is significant.

In addition to the chemical materials above, numerous radiation sources are located throughout the IGS site. Management of these fall under PAI #98 ("Radiation Safety Procedures and the IPSC ALARA Program"), and the Radiation Safety Team. The emergency procedures in Section 5.0 of this PAI will still be followed for incidents involving radioactive materials along with the requirements in PAI #98.

4.1.3 Use

Hazardous materials usage and handling is restricted to trained individuals and will be limited in use as per the MSDS, Chem Log, and other on-site reference information for the specific hazardous material.

4.1.4 Labeling

Hazardous material labeling requirements are given in PAI #152 ("Hazardous Material Labeling").

4.2 Hazardous Waste

Hazardous waste shall be managed as mandated by federal and state law. Refer to 40 CFR 260-279 and UAR 315 for specific details. In all cases of Hazardous Waste Management, the Environmental Section will take the lead.

4.2.1 Waste Streams

Specific waste streams generated by IPSC have been targeted for controlled management. These are:

- Anti-freeze
- Asbestos
- Batteries
 - Lead-acid
 - Lithium
 - Nickel cadmium
- Camera photographic waste (aperture card)
- Lab wastes
- Light bulbs (fluorescent and mercury)
- Herbicides and Pesticides
- Mercury
- Solvents, cleaning
- Solvents, paint
- Used oil
- Waste paints and thinners
- Spent corrosives

4.2.2 Hazardous Waste Storage

The Hazardous Waste Storage facility is located on the west end of the USB Lube Storage Building. There is also an above ground storage tank for used oil at the east end of the USB Lube Storage Building. The waste streams identified above are stored in these two areas prior to treatment or disposal. The wastes are properly containerized and properly labeled for identification.

Additional "satellite" areas have been designated for the accumulation of hazardous waste (see attached Site Plan - Exhibit #1). Wastes in these areas include batteries, paint, camera waste, lab wastes, and mercury switches. Once 55 gallons of waste has been accumulated in any area, that waste must be moved to the Hazardous Waste Storage Building.

When Safety Kleen services the solvent cleaning stations, some of the used solvent removed from service is also considered hazardous waste, and must be managed as such, even though it is not stored on site.

4.2.3 Waste Storage Management

4.2.3.1 There are unique labeling requirements for hazardous waste containers. The IPSC Environmental Section shall be responsible for hazardous waste labeling (Refer to PAI #152, "Hazardous Material Labeling").

4.2.3.2 Any department that requires storage or shipment of a hazardous waste must contact the IPSC Environmental Section to ensure proper handling, transportation, storage, and disposal per government regulations (see Section 4.2.4).

4.2.3.3 Access to the Hazardous Waste Storage Facility is allowed only to authorized personnel. The facility will remain locked when not occupied. Keys are issued only to IPSC's Plant Manager, Staff, Asst. Supt. of Operations, and the IPSC Environmental Section.

4.2.4 Transporting and Disposal of Hazardous Wastes Off Plant Site

The IPSC Environmental Section or their approved designee only will deal with transportation and disposal of hazardous wastes generated on site by IPSC or contractor.

4.2.5 Identification of Hazardous Waste

Hazardous waste is generated from certain hazardous materials that are spent or used. A full description for identification can be found in PAI #144 ("Minimization and Control of Hazardous Material and Waste"). All hazardous waste streams at IPSC have been identified. However, should a question arise regarding an unknown substance, or any hazardous material, contact the Environmental Section for clarification before disposing of any such substance.

When hazardous wastes are to be recycled, incinerated, destroyed or burned as a fuel, a chemical profile or analysis is performed that may include testing for:

- Hazardous waste characteristics: (Ignitability, Corrosivity, Reactivity, and Toxicity)
- PCB's
- Heating Value
- Chlorinated and Fluorinated Hydrocarbons
- Ph
- Physical State (liquid, solid, and color)
- Layered (single, bi-, or multi-)
- Specific Gravity
- Cyanides
- Phenolics
- Sulfides
- Liquid Flash Point
- Arsenic
- Barium
- Cadmium
- Chromium - Hex
- Lead
- Mercury
- Selenium
- Silver
- Copper
- Nickel
- Thallium
- Zinc

4.2.6 Disposal

If a material is characterized as a hazardous waste, IPSC Environmental Section shall properly arrange for transportation of this material off site for disposal within 90 days per government regulations.

A chemical profile sheet, a Hazardous Waste Manifest shipping form, and a Land Disposal Restriction Certification shall be completed by the Environmental Section as specified by DOT and EPA regulatory requirements prior to off-site transportation. The disposer shall provide IPSC a copy of the signed and dated Hazardous Waste Manifest shipping form.

4.2.7 Record Keeping

Permanent records shall be maintained at IPSC. One copy will be kept by the Environmental Section, and one in the general files for the life duration of the IGS.

4.2.8 Small Quantity Generator

The IGS and ICS site is now classified as a small quantity generator of hazardous waste. We produce less than 2,205 pounds (100 kilograms) of hazardous waste per month.

4.2.9 Conditionally Exempt Small Quantity Generator

The IR is classified as a conditionally exempt small quantity generator of hazardous waste (less than 100 kilograms per month).

5.0 HAZMAT Spill or Release Mitigation and Cleanup

EMERGENCY CONTINGENCY PLAN UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) AND RISK MANAGEMENT PLANNING (EPCRA)

5.1 Hazardous Materials and Waste Operations (Special Considerations)

5.1.1 Emergency Preparedness

Since IPSC has the potential to become a Large Quantity Generator of hazardous waste in any month (greater than 1,000 kilograms/month), special attention must be paid to emergency preparedness and procedures for any incident involving hazardous material or wastes. These procedures are called Contingency Plans and are designed to minimize hazards to human health and the environment from a hazardous material or waste emergency.

5.1.2 Required Actions

The provisions of this section must be carried out immediately when hazardous waste and other hazardous materials including chlorine and ammonia are involved in emergency situations such as fire, explosion, spills, etc.

5.1.3 Safety and Security

The safety of personnel and visitors is paramount. Procedures for signing visitors in and out must be followed, both for the plant and the Community Center.

5.2 Emergency Coordinator

5.2.1 Defined

The Emergency Coordinator (EC) in a hazardous waste incident is one that is familiar with IPSC's emergency response measures and has the authority to commit resources to carry out those measures. The EC must be familiar with all operations and activities at the site, the location and nature of all hazardous waste handled, the location of records, and the facility layout.

5.2.2 Identified

The Coordinator and designees, and their home phone numbers are identified in Exhibit #2. Exhibit #2 also contains a list of available resources, etc., in an emergency.

5.3 Hazardous Material and Waste Spill Response Procedure

5.3.1 Initial Report

The person observing a chemical incident shall contact the Control Room Operator (CO), either on Channel #1, or by calling 2-911. The CO shall notify the duty Assistant Superintendent of Operations and will initiate the Incident Command Procedure (see PAI #105, "Industrial Safety Brigade Procedures").

5.3.2 Evaluation

The duty Assistant Superintendent of Operations will make a determination as to the seriousness of the incident, and as to whether the incident requires additional assistance.

5.3.3 Performance

Incident response and mitigation activities shall be performed pursuant to the IPSC Incident Command System. Exhibit #2 provides a list of available resources.

5.3.4 IPSC Incident Report

The Assistant Superintendent of Operations shall notify the primary emergency coordinator by phone any time (24 hrs./day) a HAZMAT incident or response occurs. The primary EC's phone number is found in Exhibit #2.

5.3.4.1 If the incident involves radioactive material, the assistant shall also notify the RSO, and follow any additional requirements under PAI #98, ("Radiation Safety Procedures and the IPSC ALARA Program").

5.3.5 Responsibilities

The duty Assistant Superintendent of Operations will be responsible for completion of the "Hazardous Materials/Wastes Spill Notification Report" (Exhibit #3) along with all other appropriate company documents, and notification to the Plant Manager, Emergency Coordinator, Staff, Safety, and Environmental Section.

5.3.6 Required Response Actions

In addition, the Assistant Superintendent of Operations **must**:

- Activate facility alarms and communication systems necessary to notify all personnel in an affected area or off-site areas and Community Center.
- Identify the character, exact source, amount, and real extent of any release.
- Assess possible hazards to human health and environment, including both direct and indirect effects of the incident on site and off site.
- With Plant Manager or Staff approval, immediately notify federal, state, and local agencies and authorities if evacuation of the site and/or surrounding areas is necessary, or if outside assistance is required. (This is in addition to any other notification that may be required.)

Note: The Environmental Section can assist or take the lead in any notification requirements.

- Prevent spreading of the incident to other areas of the site which may include shutdown of operations.
- Provide for treating, storing, and disposing of recovered waste and contamination.
- Note in detail the incident specifics in the operating record or log.
- Delay resuming operation until affected areas are isolated from incompatible materials and cleaned up, and all emergency equipment has been decontaminated.
- Ensure that proper and timely reports and notifications are made as outlined in this PAI and per the regulations. This

includes written reports that must be filed within certain regulatory time limits.

Note: The Environmental Section can assist or take the lead in any notification requirements.

5.3.7 Spill Clean-up

The cleanup of a hazardous material must be prompt and effective, particularly if a clear and present danger exists. However, cleanup of a hazardous material spill may involve special considerations. Laws may require certain remediation practices be undertaken. Contaminated soil and material must be handled with an awareness towards appropriate legal requirements. The Environmental Section can provide assistance in this area.

5.3.8 Disposal

Disposal of any spilled material, its residue, and other contaminated material must follow the requirements of Section 4.2 of this PAI.

5.4 Arrangements With Local Emergency Services

5.4.1 Sheriff's Office

The Millard County Sheriff's Office is the lead for local HAZMAT incident mitigation. In our communication with them, we find that IPSC is better prepared to handle HAZMAT incidents on site, and will therefore not call on the Sheriff's Office for assistance in HAZMAT mitigation. IPSC will, however, call upon the Millard County Sheriff's office to assist in traffic control in potential off site impacts. IPSC does have authorization to use emergency frequencies (see letter of May 13, 1987 from Millard Co. Sheriff to IPSC).

5.4.2 Fire Departments

IPSC also has sufficient capability to handle on-site fire situations. Therefore, IPSC will not rely upon local fire departments for assistance in HAZMAT mitigation where fire is present.

5.4.3 Ambulance/Hospital

IPSC has a good working relationship with Intermountain Health Care which operates the local hospital. In fact, IHC has operated a First Aid station on site. IPSC has provided the local hospital with medical response information for all bulk chemicals on site. Also,

arrangements between IPSC and the Millard County Ambulance Service have been formalized. Refer to this arrangement in IPSC's disaster plan.

5.4.4 Plan Distribution

A copy of this PAI will be sent to each applicable local emergency agency as it is updated.

5.5 Evacuation

5.5.1 Assessment

The duty Assistant Superintendent of Operations must assess the need for evacuation during any emergency incident, and initiate evacuation procedures as dictated by those factors that can affect the safety of IPSC personnel, contract personnel, vendors, and visitors. Evacuation of the Community Center must also be considered. Evacuation of those areas surrounding the IPP site is not probable given the remoteness of the site and distances to neighboring facilities and communities, but will also be taken into account.

5.5.2 Procedure

Evacuation of areas directly affected by a HAZMAT incident shall be accomplished as described below. Employees have been trained and drilled in these procedures.

- 5.5.2.1 Announcement to evacuate shall be made both over the IPSC radio system - Channel #1, and over the public address system. Information given shall include the areas affected and any special commands for exiting. In the event a fire is also present, fire alarms will sound at affected locations equipped with such alarm systems.
- 5.5.2.2 Employees in the area of the hazard shall proceed to the nearest exit or stairway located away from the hazard. Do not use elevators. Each employee has the responsibility of reviewing the location of exits and pathways before entering work areas.
- 5.5.2.3 Each department has designated a primary and at least two subordinate meeting areas in the event of evacuation. Employees are required to meet at the area located farthest from the hazard, and report to their immediate supervisor. Once tallied, search and rescue efforts will begin for employees unaccounted for. No one

may return to their work areas until an all clear signal is given.

5.5.2.4 For large scale evacuation of the site, the duty Assistant Superintendent of Operations shall designate reception areas for evacuated personnel, as well as organize the means for personnel transport and aid. This will be performed in coordination with IPSC department superintendents/managers. Each has direct responsibility for the people of his department. The upper IGS parking lot is designated as the primary staging area for site evacuation.

5.5.2.5 Personnel manning the Community Center shall coordinate evacuation of visitors from the Center under guidance from the Emergency Commander.

5.5.2.6 For evacuation from the Hazardous Waste Storage area, follow these instructions:

- The two available exit paths are the doorway on the west side of the north wall (primary route), and the bay door that takes up most of the remaining north wall (alternate route).
- Notify others in the room by voice and hand signal of the emergency condition, and exit by selecting the quickest, yet safest pathway to leave the building.
- Initiate emergency response procedures either by radio on Channel #1, by phone at 2-911, by fire alarm, or by any combination.
- Go to the USB and notify your supervisor of your whereabouts and condition.
- Stay at the USB until instructed otherwise.

5.6 Chemical Spill Containment Personnel

5.6.1 Fire Brigade

The Fire Brigade on duty shall be the designated first response personnel for HAZMAT incident mitigation, control, and containment. HAZMAT responses are handled under the IPSC Incident Command System (see PAI #105, "Industrial Safety Brigade Procedures").

5.6.2 Additional Resources

The duty Assistant Superintendent of Operations will determine if the spill requires additional assistance, and if cleanup requires immediate attention or can be deferred. Plant personnel may provide spill assistance as follows:

- The painters shall be the designated personnel to clean up a hazardous material wastes chemical spill. Their working hours are from 07:00 to 17:30, Monday through Thursday, or Tuesday through Friday.
- The Environmental Staff is available to assist with an incident spill from 07:30 to 17:00, Monday through Friday. One Environmental person will be working 07:30 to 17:00, Saturday and Sunday (holidays excepted).
- The Safety/Training Section is available to assist with an incident spill from 07:00 to 17:00, Monday through Friday and are on 24-hour call.
- During off-shift periods, the painters will be called out to begin the cleanup operations if the Emergency Coordinator or designee determines that cleanup cannot be deferred.

5.7 Chemical Spill Containment, Decontamination, and Cleanup Equipment

5.7.1 Equipment List

IPSC is prepared to handle any chemical spill on site without the use of outside resources. Equipment available for spill mitigation include a fully stocked HAZMAT trailer, fire response equipment, ambulance, heavy duty mobile equipment, and spill response gear that include personal protective equipment, decon shower, absorbent, and neutralizing agents. A full list is found in Exhibit #2, and is updated as needed.

5.7.2 Testing

The Safety/Training Section shall test and maintain the safety, fire, and response equipment described in 5.7.1 and Exhibit #2 to ensure maximum safety protection. The Environmental Section shall conduct monthly quality assurance audits on the trailer and its equipment and materials, and document these audits in quality control logs.

5.8 Training Requirements

5.8.1 Eligible Personnel

Eligible HAZMAT response, containment, and cleanup personnel will include staff, operations management personnel, fire brigade members, safety/training personnel, environmental personnel, and the painters. A list of all eligible HAZMAT personnel will be maintained by the Safety/Training Section. This list and any updates will be distributed to Staff, to the Control Room CO's desk, to all Assistant Superintendents of Operations, and to the Environmental Section.

5.8.2 40-Hour Training

The hazardous materials/wastes chemical spill personnel members (identified in 5.8.1) shall receive an initial 40 hours of training.

5.8.3 Refresher Training/Competency

The above employees (5.8.1) shall also receive recurrent refresher training of sufficient content and duration to maintain their competency, or shall demonstrate competency in those areas at least yearly. An example of competency would be a demonstrated ability to use a self-contained breathing apparatus in a totally-encapsulated chemical protective suit. A second example would be to measure the ability of an Incident Commander and the Fire Brigade to perform during a drill sequence.

5.8.4 Trainers

The trainers who teach any of the applicable training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

5.8.5 Special Equipment Training

The Safety/Training and Environmental Sections shall receive specific instruction on equipment inspection, and care in order to ensure the availability of emergency HAZMAT equipment.

5.8.6 Special Patient Care Training

The Safety/Training Section shall receive specific instructions on patient care involving hazardous material exposure.

5.8.7 Hazardous Waste Training

Environmental personnel shall receive annual hazardous waste training as required under RCRA.

5.9 Medical Surveillance Program

5.9.1 Questionnaire and Review

A medical evaluation questionnaire shall be completed by all personnel involved in hazardous materials/wastes chemical spill response and cleanup activities. This information shall be reviewed by a physician licensed in occupational medicine. If the attending physician observes an abnormal condition, he or she can request a medical examination. The medical surveillance program is administered by the Safety/Training Section.

5.9.2 Exposure

If an employee is exposed or there is reason to believe an employee could have been exposed to contaminant levels at or above IDLH (Immediately Dangerous to Life or Health) standards, he or she shall receive a blood medical examination by a qualified physician, which shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

5.9.3 Monitoring

Ambient air monitoring of personnel exposure to pollutant levels shall be performed by the Safety/Training Section.

5.9.4 Records

Records shall be retained for each employee subject to this program for the duration of employment, plus thirty (30) years.

5.9.5 On-Scene Medical Management

On-scene medical care will be provided and managed by the Safety/Training Section.

6.0 Spill Reporting to Outside Agencies

6.1 Discussion and Definitions

6.1.1 Notification is required for the release or threatened release of reportable quantities of hazardous and extremely hazardous substances into the environment. Reporting is required under several environmental regulations; care must be exercised to ensure all agencies have been notified of reportable releases.

6.1.2 Reportable quantity varies with the material. Lists and quantities are found in the Code of Federal Regulations (CFR), Title 40. See 6.2 for specific reporting requirements for identified chemicals.

6.1.3 "Release" can vary in meaning depending upon the regulation that applies to the spilled chemical. Under CERCLA (Superfund Law), "Release" means any spilling, leaking, discharging, escaping, etc., into the environment in excess of a reportable quantity, but excludes any release which results in exposure to persons solely within a building or structure. Therefore, CERCLA may require notifying the National Response Center even if the spill did not leave the property boundaries.

Under the Superfund Amendments and Re-Authorization Act (SARA), reporting is only required if a spill of reportable quantity leaves the site.

Other regulations of interest where reporting can apply include RCRA (Hazardous Waste Law), CAA (Clean Air Act), CWA (Clean Water Act), and any applicable state laws.

6.1.4 "Hazardous Substance" means any substance listed in 40 CFR, Part 302 (CERCLA).

6.1.5 "Extremely Hazardous Substance" means any substance listed in 40 CFR, Part 355 (SARA).

6.1.6 Facilities must immediately notify the local emergency planning committee, and the state emergency response commission if there is a release that exceeds the reportable quantity for either hazardous or extremely hazardous substances. In addition, the release of a reportable quantity of a hazardous substance must follow with immediate notification to the National Response Center.

6.1.7 The emergency notification needs to include:

- The chemical.
- An indication of whether the substance is extremely hazardous.
- An estimate of the quantity released into the environment.
- The time and duration of the release.
- Whether the release occurred into the air, water, and/or land.

- Any known or anticipated acute or chronic health risks associated with the emergency.
- Proper precautions such as evacuation.
- Name and telephone number of the contact person.

6.1.8 Notification Numbers:

A list of agency contacts is listed in Exhibit #4.

- 6.1.9 Section 6.2 contains information for determining when to report. **However, if there is any doubt, always report.** It costs little to report and be wrong about it, but the penalties for not reporting when required can be tremendous.

The Environmental Section can provide assistance and/or do the appropriate calling and reporting as requested.

6.2 Reporting to Regulatory Authorities

6.2.1 Introduction

Several regulations with which IPSC is required to comply mandate notification in the event of a hazardous release. Each law has its own list of hazardous materials or substances, as well as its own interpretation of release into the environment. The following list identifies those regulations and the location of these chemical lists:

- Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), 40 CFR 302.
- Resource Conservation and Recovery Act (RCRA), 40 CFR 261.
- Superfund Amendments and Re-Authorization Act (SARA), 40 CFR 355.
- Clean Water Act (CWA), 40 CFR 110, 116, 117.
- Clean Air Act (CAA), 40 CFR 70.
- Dept. of Transportation (DOT - HM181), 49 CFR 170-177.

In the event of a spill of material that is listed in one of these regulations, a report may be required to be made depending upon the amount and extent of the spill. Each material has a reportable quantity associated with it. If the amount of the spill exceeds the

reportable quantity for the material in question, and a release into the environment occurs, notification must be made as described in the regulations.

A release occurs when a hazardous material enters the environment. CERCLA dictates that a threatened release is also reportable. A threatened release is one where a reportable quantity of a hazardous substance is uncontrolled and has the **potential** to enter the environment.

For instance, a sulfuric acid leak from a transport truck during unloading could trigger reporting requirements if 1,000 pounds or more spills to the pavement. Even though it is still on site, it is uncontrolled because it is not in a containment area of some form, and could possibly leave the site (although not probable), thus making it reportable. Other vectors or avenues of release must also be considered when assessing reportability. Quantities of volatile emissions to the air or releases to water must be determined for reporting purposes.

Examples of releases into air that IPSC could face include chlorine (RQ = 10 pounds) and ammonia (RQ = 100 pounds). IPSC is not situated where releases into waters of the State or U.S. is probable, with the exception of the DMAD pump house and the IR. An example of a reportable release would include oil. The reportable quantity for oil is clear evidence of a sheen on the water.

6.3 Reference Material

Several references are available for determining reportability. Understanding and knowledge in the use of these references are necessary for speed and accuracy. The Emergency Coordinators and Environmental personnel can assist when needed.

The following references provide a variety of information ranging from specific regulatory requirements to data on determining the chemical makeup of unknown products.

Code of Federal Regulations, Title 40, Sections 70, 110, 116, 117, 261, 302, and 355. These are located in the Environmental Section of Technical Services in the Administration Building. They contain the actual regulation content and lists of chemical reportable quantities.

Suspect Chemicals Source books. These are located in the HAZMAT trailer and Environmental Section. They contain chemical lists that are cross-referenced to all regulations.

TOMES. TOMES is a chemical database on CD-ROM or by Internet on computers located in the Technical Services Department in the Environmental Section. It provides in one location the regulatory, cross-reference medical, synonym, and other information or data on a substantial list of chemicals.

MSDS Log Files. IPSC maintains an MSDS file for chemicals on site. This file is available through "CHEM LOG" on the Prime mainframe, or from hardcopy files located in the HAZMAT trailer and at several work stations throughout the site. The file is useful for determining chemical makeups of products IPSC uses.

Gardener's Chemical Synonyms and Trade Names. This book is useful for those chemicals identified only by trade name or synonyms unfamiliar to responders. It is located in the HAZMAT trailer and in the Environmental Section.

Regulatory Database CD-ROM Containing Regulations Applicable to IPSC. These are found in the Environmental Section, or accessed on the LAN.

6.4 Procedure for Determining Required Reporting

6.4.1 Chemical Identification

Upon assessing the spill incident, the Emergency Coordinator or designee must determine the chemical makeup of the spill. This can be done by observation, process knowledge, etc., or by referring to some source. Bulk storage chemicals are well identified. Labeling is provided as required on all chemicals. However, trade name or synonym usage may require the use of references. If no definite determination can be made, testing may be necessary. The HAZMAT trailer contains equipment for identifying unknowns.

6.4.2 Extent of Spill

A determination must be made as to the amount of chemical spilled. This can be done through records or before/after container measurements, or estimation using area and depth of penetration.

6.4.3 Vectors of Release

When determining the extent of the spill, consideration must be given to other avenues through which the chemical may dissipate.

This includes soil, air, and water contamination. Quantities of release into **each** vector must be assessed. Any one, or a combination of any, may trigger reporting.

6.4.4 Regulatory Status

Determine if the chemical is regulated. If it is, it will have a reportable quantity associated with it. If the chemical spilled has a Chemical Abstract System Registry number (CAS #), its regulatory status can be determined easily with the Suspect Chemical Source book or TOMES. Otherwise, it can be looked up by name or synonym in the regulations, TOMES, or other reference.

Note: Even if the chemical is not specifically listed, its chemical class or the circumstances of its release can still trigger reporting.

Caution must still be exercised before determining that a report is not necessary.

6.4.5 Reportable Quantity

Each vector of release, the air, water, ground, etc., will have a reportable quantity associated with it. If the chemical was released into any one or more (multi-media) of these in an amount in excess of the quantity regulated, a report must be made. This includes the aggregate of a multi-media release. Just because each vector may not have a reportable quantity, if the aggregate of the spill released into the environment exceeds any reportable quantity, report it. A multi-media release can involve applying the laws of RCRA, CAA, CWA, CERCLA, SARA, etc.

6.4.6 Reporting

Upon determining that a spill is reportable, (e.g., is a regulated substance and is at or above a reportable threshold), a report must be filed **immediately** with applicable authorities. This must be filed first by telephone, and followed up within five (5) days with a letter. Those agencies to report to are found in Exhibit #4 of this PAI. In the event of a CERCLA, RCRA, CWA, or CAA release, report to all numbers listed. In the event of a SARA release, report to all except the National Response Center in Washington, D.C.

6.4.7 Special Considerations

CERCLA goes further and requires reporting of "threatened releases." Determination of what constitutes a threatened release will have to be made on a case- by-case basis.

IPSC must notify appropriate agencies of any transportation incidents involving a hazardous substance (including those which occur during loading, unloading, or temporary storage) even though a spill of a reportable quantity may not have occurred. A hazardous substance is that which is defined and listed under CERCLA, 40 CFR 302.

Immediate notification is required if an incident:

- causes death or serious injury requiring hospitalization;
- involves more than \$50,000 in damage;
- involves the release of radioactive materials or etiologic agents;
- requires public evacuation; or,
- causes a facility to close for more than an hour.

In such cases, there must be an immediate call made to the National Response Center, the state highway patrol, and other agencies.

If a spill involving a hazardous waste occurs, the reportable quantity is 100 pounds (or less, in some cases) under CERCLA, but if any amount leaves the site, a report must be made.

The reportable quantity for a release from an underground storage tank is 25 gallons. A release includes leaking or spilling not only from the tank, but from any associated piping and equipment.

Other agencies may have to be contacted depending upon the situation. These agencies include Division of Wildlife Resources, Bureau of Land Management, Division of Mineral Resources, Division of Radiation Control, local fire departments, hospitals, Division of Air Quality, etc. (See Exhibit #4 for phone lists).

6.4.8 Assistance

The Environmental Section is available for assistance in making the determination of whether an incident is reportable.

The following table can be used as a generic guide to help in reporting incidents to proper authorities.

TABLE 1. HAZARDOUS SUBSTANCE INCIDENT REPORTING AND NOTIFICATION MATRIX

REGULATION	INCIDENT	WHO REPORTS	TO WHOM	IMMEDIATE	FOLLOW-UP
29 CFR 1904.2 (a)	Recordable occupational injury or illness.	Employer	Log and summary of injuries and illnesses.	Within six days. Use OSHA Form 200.	Not Applicable.
29 CFR 1904.8	Fatality or multiple hospitalization. (One or more fatality or three or more hospitalized.)	Employer	Nearest OSHA office.	Within eight hours: •Circumstances; •Number killed and injured; •Extent of injuries.	As required by agency.
29 CFR 1910.1003- 29 CFR 1910.1016(f)(2) 29 CFR 1910.1017(n)(2) 29 CFR 1910.1017(n)(3) 29 CFR 1910.1045(d)(2)	Release of a listed carcinogen (see 29 CFR 1910, Subpart Z). (Material is outside of closed system or isolated system with potential exposure.)	Employer	Nearest OSHA area director.	Within 24 hours (1910.1003-1017), within 72 hours (1910.1045): •Report incident; •Available facts; •Medical treatment for exposed employees.	Within 15 days (1910.1003-1016), within 10 days (1910.1017), upon request (1910.1045): •Quantity released; •Duration of release; •Release calculations; •Description of area; •Extent of employee exposure and area contamination; •Medical treatment provided; •Medical surveillance program details; •Analysis of incident circumstances and preventive measures with completion dates.
33 CFR 153.203	Discharge of oil, pollutant or other hazardous substance. (Discharge in excess of effluent standard.)	Person in charge of vessel or facility.	National Response Center. If not practical, then U.S. Coast Guard or EPA on-scene coordinator, then NRC as soon as possible.	Immediately following knowledge of discharge.	As required by agencies (follow-up to NRC not applicable).
40 CFR 61 (various subsections)	Release of hazardous air pollutants.	Owner / Operator of air emission source.	EPA Regional Administrator.	Varies by air pollutant (check specific rule).	Varies by air pollutant (check specific rule).
40 CFR 110.10	Oil discharge. (Film, sheen, or discoloration to water surface or adjoining shoreline, or violation of applicable water quality standards.)	Person in charge of vessel or facility.	National Response Center. If not practical, then U.S. Coast Guard or EPA on-scene coordinator, then NRC as soon as possible.	Immediately, as prescribed by DOT (see 33 CFR 153, Subpart B, and 40 CFR 300, Subpart E)	Not applicable.

REGULATION	INCIDENT	WHO REPORTS	TO WHOM	IMMEDIATE	FOLLOW-UP
40 CFR 117.21	Discharge of hazardous substance (RQ).	Person in charge of vessel or facility.	Appropriate government agency.	Immediately, as soon as known.	As required by agency.
40 CFR 122.41(l)(1) 40 CFR 122.41(l)(2) 40 CFR 122.41(l)(6) 40 CFR 122.41(l)(7) 40 CFR 122.41(n)(6)	NPDES permit non-compliance. (Endangering health or the environment; discharge in excess of permit allowance.)	Permittee	EPA regional administrator.	Within 24 hours: • Unanticipated bypass exceeding permit effluent limits; • Upset condition exceeding permit effluent limits; • Violation of maximum daily discharge limits.	Within five days: • Description of non-compliance and its cause; • Dates and times of non-compliance; • Dates and times of expected continuance of non-compliance; • Steps taken or planned to prevent recurrence.
40 CFR 122.42(a)(1) 40 CFR 122.42(a)(2)	NPDES permit non-compliance. (Discharge of specific toxic pollutants or other toxic pollutants at certain concentrations not covered or limited by the permit.)	Permittee	EPA regional administrator.	As soon as known, additional to those requirements in 40 CFR 122.41 for any toxic pollutant not limited in the permit.	As required by agency.
40 CFR 262.34(d)(5) (iv)	RCRA generator facility emergency. (Fire, explosion, or other release that threatens human health outside the facility, or a spill that has reached surface water.)	Emergency coordinator	National Response Center.	Immediately: • Name, address and EPA identification number; • Date, time, and type of incident; • Quantity and type of waste involved; • Estimated quantity and disposition of recovered material.	Not applicable.
40 CFR 263.30(c)(1) 40 CFR 263.30(c)(2)	Discharge while transporting waste (hazardous waste).	Transporter	National Response Center (if required by 49 CFR 171.15) and DOT (if required by 49 CFR 171.16).	Earliest practicable moment (40 CFR 171.15).	Within 15 days (49 CFR 171.16).

REGULATION	INCIDENT	WHO REPORTS	TO WHOM	IMMEDIATE	FOLLOW UP
40 CFR 264.56(d)(1) 40 CFR 264.56(d)(2) 40 CFR 264.56(j).	RCRA TSD facility emergency (release, fire, or explosion which could threaten human health or the environment outside the facility).	Emergency coordinator and owner/operator.	Designated on-scene coordinator or National Response Center, state and local authorities, and EPA regional administrator.	Immediately: • Reporter's name and telephone number; • Facility name and address; • Time and type of incident; • Name and quantity of materials involved; • Extent of injuries; • Possible hazards to human health or the environment outside the facility.	Within 15 days: • Owner/operator name, address, and telephone number; • Facility name, address, and telephone number; • Date, time, and type of incident; • Name and quantity of materials involved; • Extent of injuries; • Assessment of actual or potential hazards to human health or the environment; • Estimated quantity and disposition of recovered materials.
40 CFR 265.56(d)(1) 40 CFR 265.56(d)(2) 40 CFR 265.56(j)	RCRA interim status facility emergency. (Same incidents as 40 CFR 264.56.)	Emergency coordinator and owner/operator.	Same information as 40 CFR 264.56.	Immediately (same information as 40 CFR 264.56).	Within 15 days (same information as 40 CFR 264.56).
40 CFR 264.196(d)(1) 40 CFR 264.196(d)(3)	Release from tank system or secondary containment. (Any release to the environment, unless equal to or less than 1 pound and immediately contained and cleaned up.)	Owner/operator.	EPA regional administrator; also, National Response Center if equal to or greater than RQ.	Within 24 hours.	Within 30 days: • Likely route of release migration; • Surrounding soil characteristics; • Sampling and monitoring results; • Proximity to downgradient drinking water, surface water and populated areas; • Description of actions taken or planned.
40 CFR 265.196(d)(1) 40 CFR 265.196(d)(3)	Release from tank system or secondary containment. (Same incidents as 40 CFR 264.196.)	Owner/operator.	Same as 40 CFR 264.196.	Within 24 hours.	Within 30 days (same information as 40 CFR 264.196).

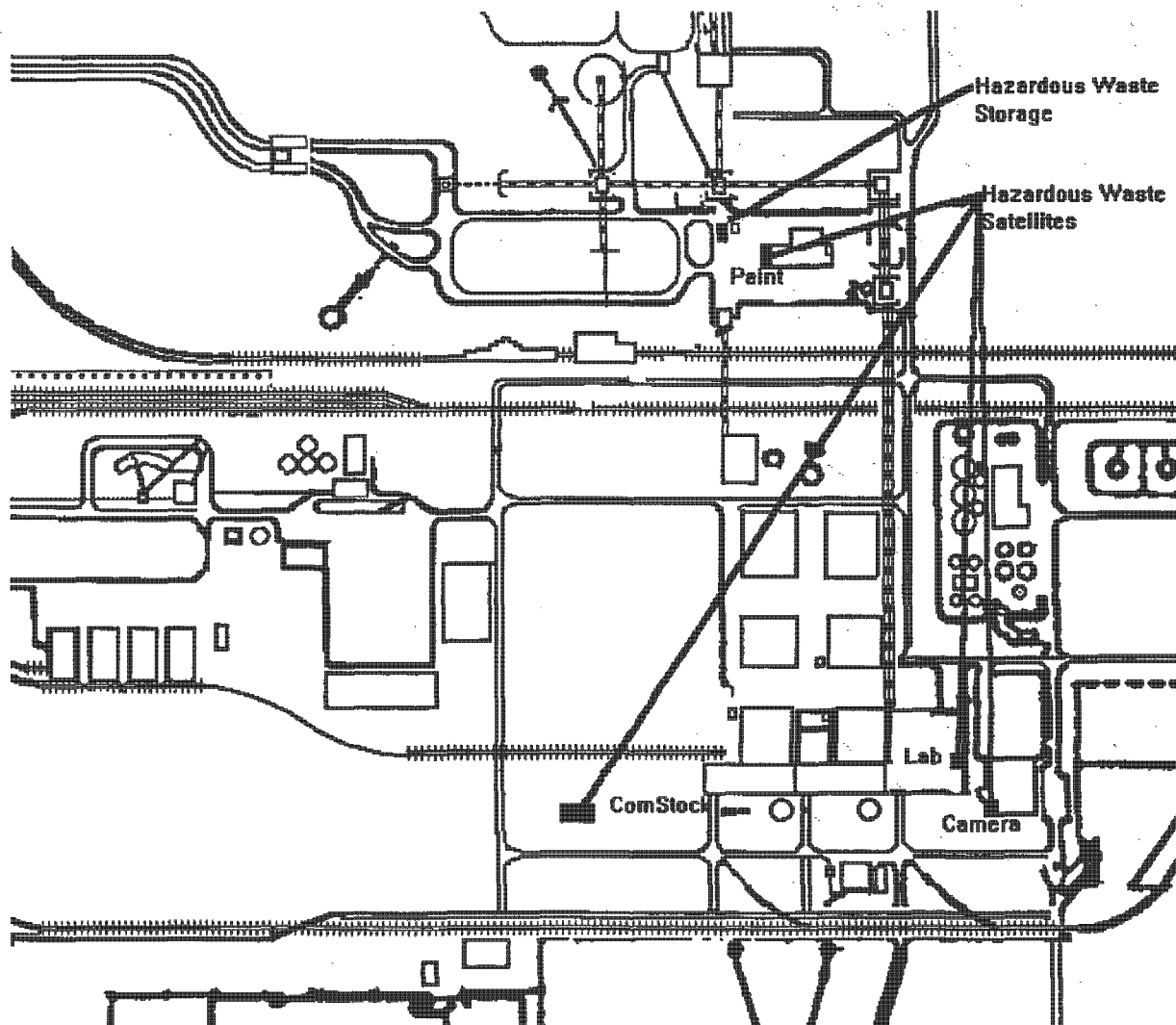
REGULATION	INCIDENT	WHO REPORTS	TO WHOM	IMMEDIATE	FOLLOW-UP
40 CFR 280.50 40 CFR 280.52 40 CFR 280.53(a) 40 CFR 280.53(b) 40 CFR 280.60 40 CFR 280.61	Release from underground storage tank. (Free product or vapor in soils, sewers, or surface water, unusual operating conditions, unexplained water, etc. Also greater than 25 gallons of petroleum sheen, or equal to or greater than RQ, etc.)	Owner/ operator.	Implementing agency (or National Response Center if equal to or greater than RQ).	Immediately, if release is equal to or greater than RQ; otherwise, within 24 hours (40 CFR 280.50, 40 CFR 280.53, and 40 CFR 280.61).	Within seven days (40 CFR 280.52) or within 20 days (40 CFR 280.62).
40 CFR 270.30(l)(6)	RCRA permit non-compliance. (Endangering health or the environment.)	Permittee	EPA regional administrator.	Within 24 hours: •Name, address, and telephone number of owner/operator; •Same information for facility; •Date, time, and type of incident; •Name and quantity of substance involved; •Extent of injuries; •Assessment of actual or potential hazards to environment or human health outside the facility; •Estimated quantity and disposition of recovered material.	Within five days: •Description of non-compliance and its cause; •Dates and times of non-compliance; •Dates and times of expected continuance of non-compliance; •Steps taken or planned to prevent recurrence.
40 CFR 302.6(a)	Hazardous substance release. (Equal to or greater than RQ.)	Person in charge of vessel or facility.	National Response Center.	Immediately.	Not applicable.
40 CFR 355.40(b)(1) 40 CFR 355.40(b)(2) 40 CFR 355.40(b)(3)	SARA extremely hazardous substance release or CERCLA hazardous substance release. (If equal to or greater than RQ, see 40 CFR 355, Appendix A for SARA EHS list or 40 CFR Table 302.4 for CERCLA HS list.)	Owner/ operator.	Local emergency planning committee, state emergency response commission, or local emergency response personnel (911 in case of transportation-related release).	Immediately: •Name and identity of substance involved; •EHS (yes or no); •Estimated quantity of release; •Time and duration of release; •Medium receiving release; •Known or anticipated health risks, medical advice for exposed individuals; •Proper precautions to take as result of release.	•As soon as practicable; •Update previously supplied information; •Actions taken to respond to and contain the release; •Known or anticipated health risks; •Medical advice for exposed individuals.

REGULATION	INCIDENT	WHO REPORTS	TO WHOM	IMMEDIATE	FOLLOW-UP
40 CFR 761.120(a)(2) 40 CFR 761.125(a)(1) Note: RQ is 1 pound (117.3 and 302.4); 40 CFR 761.125 has a 10 pound threshold. RQ preempts 10-pound threshold. See also 40 CFR 761.120(e)	PCB spill. (Equal to or greater than 50 ppm concentration with release to surface water, drinking water supplies, sewers, grazing lands, etc.) [Spill definition is any PCB quantity equal to or greater than 50 ppm (40 CFR 761.123).]	Responsible party.	National Response Center, and EPA Regional Office of Pesticides and Toxic Substances for RQ release; EPA-OPTS for other incidents.	Immediately for RQ release. Shortest possible time (no later than 24 hours) for other incidents.	As required by agency.
49 CFR 171.15(a) 49 CFR 171.15(b) 49 CFR 171.16(a) 49 CFR 171.16(b) [See exceptions listed in 49 CFR 171.16(c) and 49 CFR 171.16(d)]	Transportation incident. (Hazardous materials incident resulting in fatality, injury requiring hospitalization, property damage greater than \$50,000, more than one hour's shutdown of major transportation arteries and facilities, public evacuation of more than one hour, other situations.	Carrier	DOT National Response Center or Center for Disease Control, as appropriate. Written report to Information Systems Manager, Research and Special Programs, DOT.	Earliest practicable moment: • Name of reporter; • Carrier name and address; • Telephone number where reporter can be contacted; • Date, time, and location of incident; • Extent of injuries; • Class, name and quantity of material; • Type of incident and nature of hazard.	Within 30 days (as required by 49 CFR 171.16): • Use DOT Form F5800.1; • Copy of manifest (if waste); • Estimated quantity of waste removed from incident scene; • Name and address of receiving facility; • Disposition of any unremoved waste.
Uniform Fire Code, 1991 editions, Secs. 80.105(a) and 80.105(b)	Unauthorized discharge. (Hazardous material release reportable under federal, state, or local regulations.)	Permittee	Fire Chief.	Immediately.	Accurate records must be maintained.

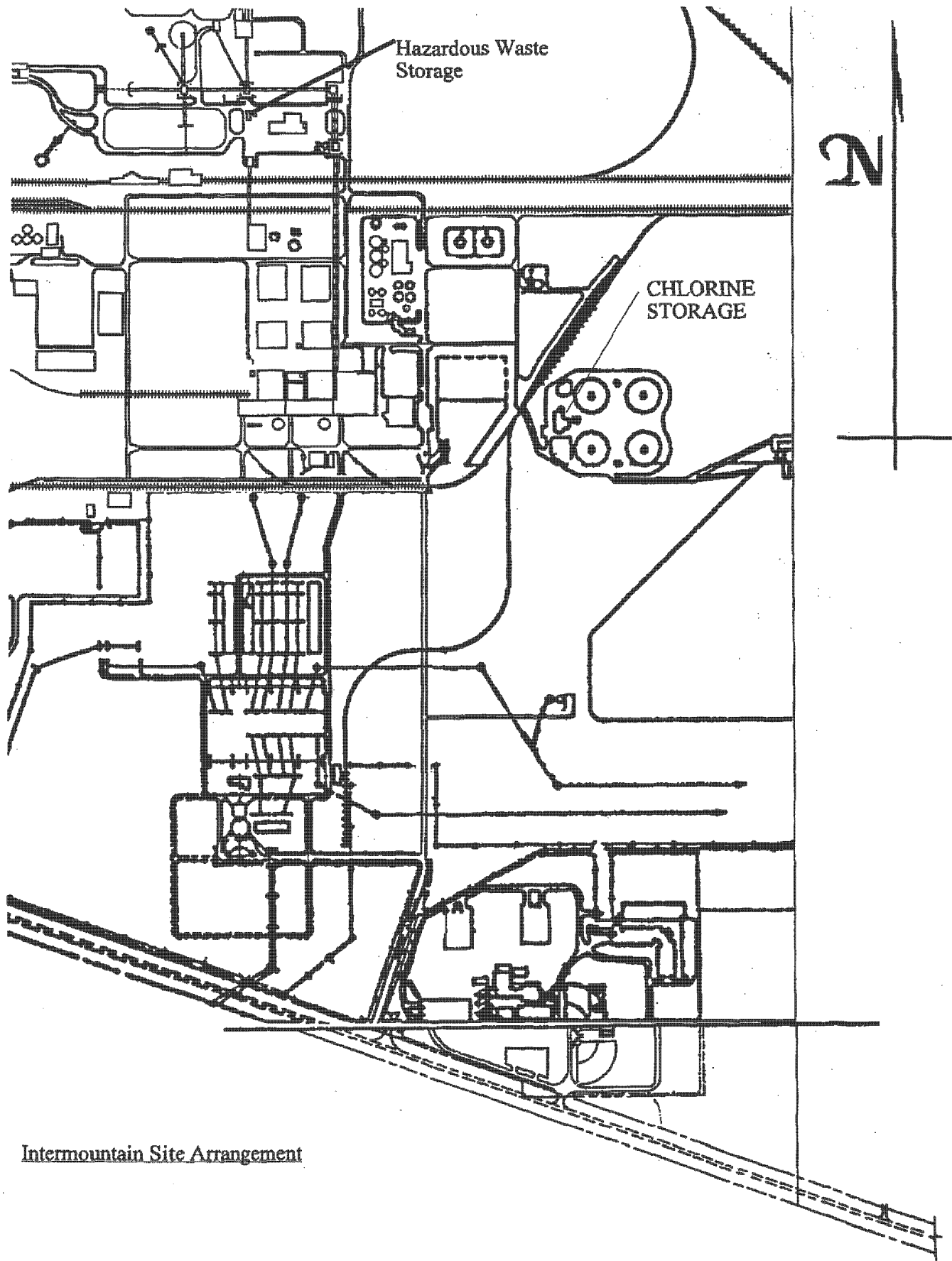
EXHIBIT #1

IGS/ICS SITE PLAN

IPP Site Arrangement



- The 90-day Hazardous Waste Storage Room is located in the USB Bulk Lube Storage Building.
- The satellite accumulation areas consist of:
 - I&C/Electrical Salvage (batteries/mercury) in the Comstock Building
 - Paint Shop (paint related materials) in the USB
 - Lab (toluene) in the GSB
 - Documentation Room (camera waste) in the Admin Building



Intermountain Site Arrangement

EXHIBIT #2

LIST OF EMERGENCY RESPONSE PERSONNEL AND RESOURCES

EXHIBIT #2

(Page 1 of 4)

AVAILABLE RESOURCE LIST FOR IPF EMERGENCIES

PERSONNEL

President and Plant Manager - S. Gale Chapman

Staff	-	Neil Clay,	Mgr. Support Services
		George W. Cross	Supt. Operations
		Joe Hamblin,	Supt. Maintenance
		Dennis Killian,	Supt. Technical Services
		Norman Mincer,	Mgr. Converter Station

(1) Primary Emergency Coordinator: Home Phone
Dennis Killian 334 S. Cottonwood Dr. (435) 864-4712
Delta, Utah 84624

(5) Emergency Coordinator Designees or Alternates:

One of the following individuals will be on duty and will normally be responsible for emergency response. The order in which they assume responsibility as an emergency coordinator is based on duty rotation.

Assistant Superintendents of Operations -

Crew Shift 1 - Ken Lebbon	173 N. 300 W., Delta	(435) 864-4323
Crew Shift 3 - Boyd Cowley	1019 N. 13550 E., Oak City	(435) 846-2038
Day Shift - Jon Finlinson	8950 N. Hwy 125, Leamington	(435) 857-2566
Crew Shift 2 - Richard Schmidt	111 S. Center St., Delta	(435) 864-4578
Crew Shift 4 - Joe Duwel	250 E. 500 S., Oak City	(435) 846-3651

(5) Fire Brigade/HAZMAT Response Teams

(9) Emergency Medical Technicians (EMT's)

(44) State Certified First Responders

(8) Environmental Support

COMMUNICATIONS

(1) Plant-wide Paging System - Siren

(200+) UHF, on-site IPSC 4-channel hand-held radios

(4) UHF, on-site IPSC Base Repeaters

(9) VHF High Band or Citizen Band radios, compatible with county and state frequencies.

EXHIBIT #2

(Page 2 of 4)

AVAILABLE RESOURCE LIST FOR IPF EMERGENCIES

EMERGENCY EQUIPMENT

<u>Item and Description</u>	<u>Location</u>
20' HAZMAT Response Trailer	Stack
Contains:	
PPE	
12 "A" Level Encapsulated Suits	
14 "B" Level Encapsulated Suits	
6 "B" Level Suits	
6 "C" Level Tyveks	
6 SCBA w/built-in communications	
6 Full face air-purifying respirators, boots, gloves, goggles, and other PPE of assorted size and type.	
Eye wash	
First aid kit	
Decontamination shower and booth, wading pools, Decon backboard, and gurney containment for injured personnel.	
<u>Response Equipment</u>	
Acid neutralizers	
Caustic neutralizers	
Solvent/hydrocarbon absorbers	
Vermiculite absorbent	
Absorbent matting, pillows, rags, booms	
1 ton chlorine cylinder leak kit	
150 pound chlorine cylinder leak kit	
Barrel leak kit	
Pipe leak kit	
Extinguisher	
Gear pump	
Test kits	
Drums, shovels, tools, implements, utensils, etc.	
Ford F-700, 750 gpm, 500 gallon, 2 stage pumper/booster truck	Site Services
National V3 Foam trailer, 200 gallon 3 percent concentrate and monitor	Site Services
Mako 9.2cfm SCBA filling compressor	Site Services
Mako 18.7cfm SCBA filling compressor	Site Services

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EXHIBIT #2

(Page 3 of 4)

AVAILABLE RESOURCE LIST FOR IPF EMERGENCIES

EMERGENCY EQUIPMENT

<u>Item and Description</u>	<u>Location</u>
(40) SCBA's 4.5 (45 minutes)	Ubiquitous
(12) extra SCBA tanks	Site Services
(2) Air-line supply stations with escape packs	Scrubbers and Warehouse 4
Ford Ambulance, Type II, two-patient capacity	Site Services
Safety Response Van, equipped	Site Services

OTHER AVAILABLE RESOURCE EQUIPMENT

(2) Caterpillar water truck and wagon, 8,000 gallon capacity	Coal Yard/USB
Passenger vans and bus, for personnel transport	Admin. Bldg.
Guzzler vacuum truck, high capacity	Utility Services Bldg. (USB)
(2) Letourneau dozers	Coal yard
Cranes 6, 8, 28, and 90 ton	USB
Mitsubishi track-hoe	USB
Cat back-hoe	USB
John Deere dozer	USB
Fiat Allis dozer	Ash pile
Cat emergency generator	USB
Kohler emergency generator	USB
Kenworth belly dump trucks	Ash Pile
Trojan road grader	USB
Bobcat loader	USB
Caterpillar grader	USB
Kenworth haul truck with belly dump or low-boy flat bed (Highway use)	USB

IP7012064

EXHIBIT #2

(Page 4 of 4)

AVAILABLE RESOURCE LIST FOR IPF EMERGENCIES

OTHER AVAILABLE RESOURCE EQUIPMENT

<u>Item and Description</u>	<u>Location</u>
Case loader	USB
Trojan loader	USB
Cat loader	USB
Snorkellift telescoping manlift	GSB
International flat-bed truck	GSB
Mack dump truck	USB
International lube truck	USB
Ford boom truck	GSB
Mobile trackmobile	Pozzolonic
GM EMD train and switching locomotives	IGS Railways
Condor 80' telescopic manlift	ICS
Snorkellift 60' telescopic manlift	ICS
Cat 651E Scraper	USB
Mack dumpster truck with 20 dumpsters	USB
Assorted forklifts, trailers, light plants, compressors, hydraulic units, washers, pumps, welders, vehicles (pickups, sedans, Yamahaulers).	

IP7012065

EXHIBIT #3

HAZARDOUS MATERIALS/WASTES INCIDENT NOTIFICATION REPORT

EXHIBIT #3

(Page 1 of 3)

**HAZARDOUS MATERIALS/WASTES
INCIDENT NOTIFICATION REPORT**

Time Incident Is Discovered _____ Date _____

Name of Personnel Making the Report _____

Location of Incident _____

Responsible Assistant Superintendent of Operations _____

1. NATURE OF INCIDENT

Time of Incident _____

Hazardous Materials/ Wastes	Quantity	Product name/ Classification (for transportation release)
_____	_____	_____
_____	_____	_____
_____	_____	_____

Media (air, water, land) into which release occurred (if any) _____

Approximate area covered by the spill (if any) _____

Equipment affected by incident _____

Has material been released (or threatens to be released) off site (e.g., outside the property of facility boundary)?

Was the spill reported to outside agencies? _____

To Whom? _____ Time/Date _____

By Whom? _____

IP7012067

EXHIBIT #3

(Page 2 of 3)

**HAZARDOUS MATERIAL/WASTES
INCIDENT NOTIFICATION REPORT (continued)**

2. HAZARD INFORMATION

Are there any injuries/deaths involved? If yes, specify _____

Any other human exposure or immediate health effects? If yes, specify.

Any potential adverse health effects? (Consult the Material Safety Data Sheet [MSDS] for the product, if available, for health effects and medical advice, if necessary)

Is there a fire, explosion, or threat of fire or explosion?

What emergency measures have been taken to prevent public exposure? Is evacuation necessary?

Has it been necessary to make emergency notification by calling 911? Have any other authorities been notified?

Did the release result in property damage, environmental damage (ground water, surface water, soil, etc.), wildlife injury or death, property evacuation, or closure of transportation facilities? If yes, specify.

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EXHIBIT #3

(Page 3 of 3)

**HAZARDOUS MATERIAL/WASTES
INCIDENT NOTIFICATION REPORT (continued)**

3. MEASURES TO CONTROL OR CONTAIN ANY RELEASES

Describe any measures that have been taken to contain or control the incident:

List personnel involved in post-incident actions:

<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

4. STATUS OF SPILL CLEANUP

Cleaned up (check) _____ Date of completion _____

I hereby certify that the hazardous substances spilled have been cleaned up and disposed of properly.

Signature
Assistant Superintendent of Operations

IP7012069

EXHIBIT #4

FLOW CHART & AGENCY PHONE LIST FOR EMERGENCY NOTIFICATION

**THE FOLLOWING LOGIC FLOW CHART HAS BEEN DESIGNED TO ASSIST IN
DETERMINING REPORTABILITY OF THE RELEASE OF CERTAIN BULK
CHEMICALS ON SITE**

EXHIBIT #4

(Page 1 of 2)

AGENCY PHONE LIST FOR EMERGENCY CONTACT and REPORTING

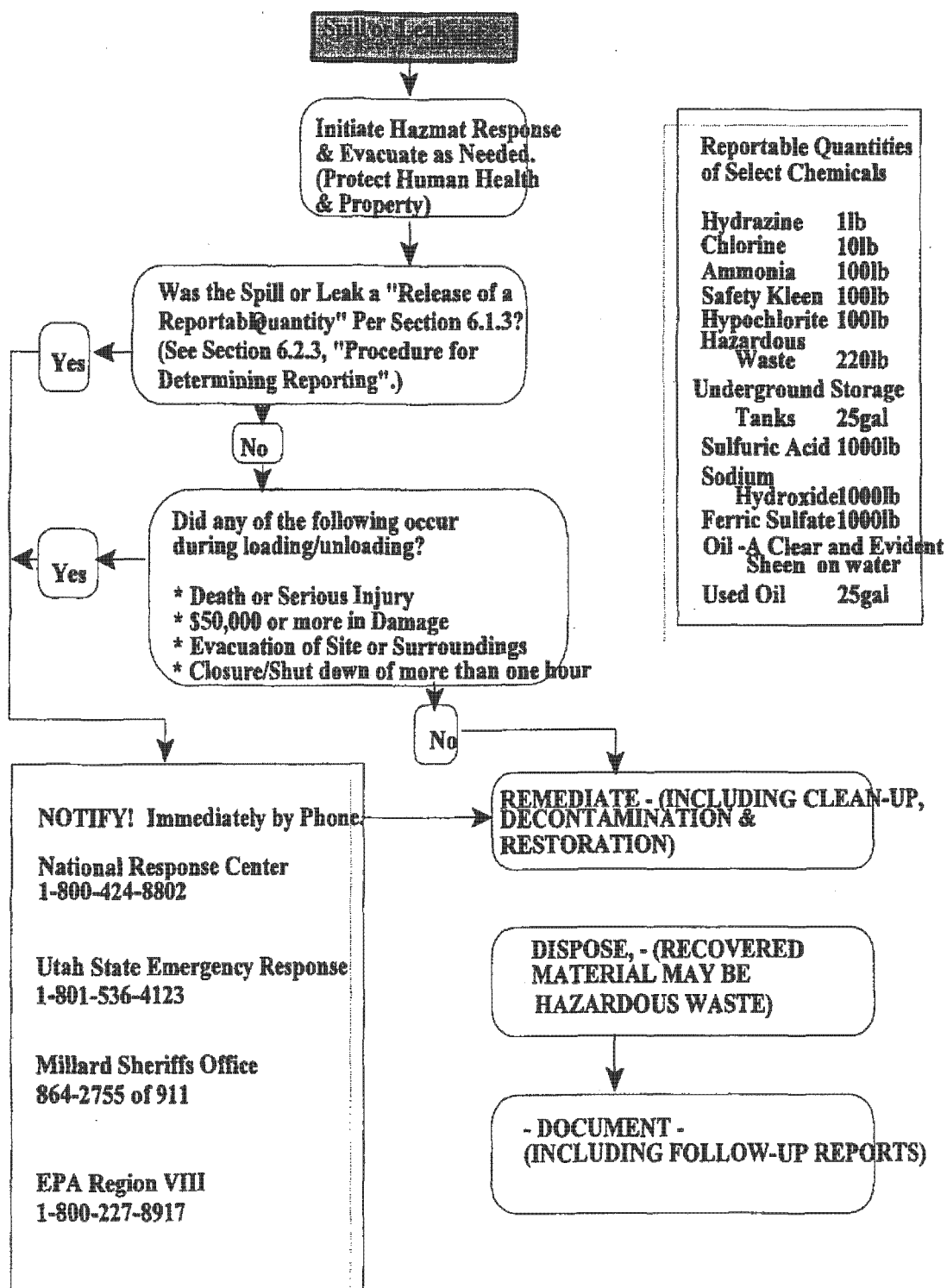
<u>Agency Name</u>	<u>Phone Number</u>
National Response Center (Coast Guard)	1-800-424-8802
EPA Region VIII	1-303-837-3895 1-800-227-8917
Utah State Emergency Response	1-801-536-4123
Millard County Sheriff's Office	864-2755 or 911
Delta Fire Department	911
Delta Community Medical Center	864-5591
Utah Highway Patrol	911
State of Utah's -	
Div. of Solid and Hazardous Waste	1-801-538-6170
Div. of Air Quality	1-801-536-4000
Div. of Emergency Response and Remediation	1-801-536-4100
Div. of Water Quality	1-801-538-61546
Div. of Radiation Control	1-801-536-4250
Div. of Natural Resources	1-801-538-7200
Div. of Wildlife Resources	1-801-538-4700
Dept. of Public Safety Emergency Management	1-801-538-3400
Industrial Commission - OSHA	1-801-530-6901

**For after hours and weekend reporting to Utah Division -
1-801-536-4123**

U.S. Fish and Wildlife Service	1-801-524-5001
Bureau of Land Management	1-435-743-6811

IP7012071

NOTIFICATION FLOW CHART



IP7012073

INTERMOUNTAIN POWER SERVICE CORPORATION

PLANT ADMINISTRATIVE INSTRUCTION

MINIMIZATION AND CONTROL OF HAZARDOUS MATERIAL AND WASTE
Title

PAI #144
NUMBER

2
REVISION NO.

Waste Minimization Committee
REVISED BY

Dennis K. Killian
APPROVED BY

S. Gale Chapman
PLANT MANAGER

4/16/96
DATE

Rand Crafts\Doug Ingraham\Les Lovell
ORIGINAL BY

01/28/91
DATE

IP7012074

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PLANT ADMINISTRATIVE INSTRUCTION

1.0 Title

MINIMIZATION AND CONTROL OF HAZARDOUS MATERIAL AND WASTE

2.0 Purpose

The purpose of this PAI is to provide instruction and guidance for minimizing both the presence of hazardous material and the generation of hazardous waste at Intermountain Power Facilities (ICS, IGS, RSC).

3.0 Scope

This PAI applies to all employees, in all departments, at all locations of any Intermountain Power Facility.

3.1 Authority

This PAI shall fall under the scope of the HAZARDOUS WASTE MINIMIZATION PLAN, which has been appended and is incorporated herein by reference (Exhibit #4).

4.0 Guidelines and Procedures

4.1 Introduction and Discussion

It is the intent of IPSC to ensure a safe work environment for our employees and community. This can be partially accomplished by limiting the presence of hazardous materials and the resulting waste. Federal law requires that hazardous waste generators, such as IPF, minimize the volume (quantity) and toxicity (degree of hazard) of any wastes generated from hazardous materials present in the workplace.

Due to the convoluted and complex nature of regulatory law, identification of hazardous wastes is difficult. For the purposes of this PAI, a brief description

follows. More specific identifications will be made by the Environmental Group.

4.1.1 A hazardous waste is generated when any substance that contains a hazardous material becomes a waste.

4.1.2 A material is hazardous if it is specifically listed by the EPA, if it has certain hazardous characteristics, or if OSHA requires the material to have an MSDS (see Exhibit #3).

4.1.3 The hazardous material becomes a waste when it is:

- No longer useful
- Abandoned
- Inherently waste like
- Disposed of
- Discarded
- Burned or incinerated
- Recycled (if stored first)
- Used in a manner constituting disposal

4.1.4 Disposal is the discharge, deposit, injection, dumping, placing, spilling or leaking (accidental or not), of any hazardous material into or on any land, air, or water.

4.2 Identification and Prioritization

Each employee is responsible for knowing the characteristic of each material used in his or her job. The CHEM LOG on PRIME is accessible to all IPF employees for this purpose. Employees should pay close attention to the requirements for safe use and handling of identified hazardous material. Proper disposal of any used product is very important. The employee's supervisor or the Environmental Group can be contacted for any questions in this regard.

4.2.1 Specific waste streams have been targeted for controlled disposal. Employees in contact with

these target substances should be trained in waste management. The waste streams are:

- Anti-freeze (ethylene glycol)
- Asbestos
- Batteries
 - Lead-acid
 - Lithium
 - Nickel cadmium
- Camera photographic waste (aperture card)
- Lab wastes
- Light bulbs (fluorescent and mercury)
- Mercury
- Solvents, cleaning
- Solvents, paint
- Used oil
- Used grease
- Waste paints & thinners
- Herbicides and pesticides

4.2.1.1 Training shall include environmental and safety awareness, and handling precautions. Supervisors are responsible for arranging appropriate training. Training can be arranged by filing a "Request for Training" form with the Safety/Training Section.

4.2.2 The Environmental and Safety Sections will perform ongoing audits of hazardous substances at IPF. Each material identified as hazardous will be evaluated and prioritized for regulatory liability and compliance and periodically reviewed for suitability. Employees will be notified by the Environmental or Safety Sections if any changes in the use or application of hazardous materials are necessary.

4.2.3 A Hazardous Material Minimization Committee will monitor waste generation and hazardous material presence. The committee will take under consideration the observations and recommendations of the Environmental and Safety

Sections, as well as those of any employee. The committee will make changes as necessary through communications with department supervisors, or through recommendations to Staff.

4.2.4 The committee shall, at minimum, have as members:

- Assistant Superintendent of Technical Services (Lab Services)
- Laboratory Supervisor
- Safety Representative
- Warehouse Representative
- Environmental Representative
- Purchasing Representative
- Planning Representative

4.2.5 The committee shall meet at least annually under the direction of the Assistant Superintendent of Technical Services (Laboratory Services).

4.3 Minimization Strategies

It is important to limit the amount of hazardous material becoming waste. This, in turn, may limit the amount of hazardous material present in the workplace. Specific methods to be discussed are housekeeping, segregation, alternate products or product substitution, product elimination, consolidation, process modification, recycling, and purchasing control.

4.4 Housekeeping

The first and simplest way towards minimization is through good housekeeping and proper material handling. For example:

- Potentially leaking valves and equipment should be kept on a preventative maintenance schedule.

- Spill trays should be placed under appropriate valves, spigots, and machinery.
- Proper equipment, such as fluid transfer devices, should be provided and used rather than having to "rig" something.
- Storage areas should be kept straightened and aisles kept clear.
- Open containers should not be left unattended.
- Work areas should be regularly inspected for leaks or potential leaks.
- Employees should review the handling of chemicals to optimize spill prevention (see PAI #101, "Spill Prevention Control and Countermeasure Plan", and PAI #106, "Hazardous Materials and Wastes Management Procedures, and Contingency Plan").
- Hazardous material containers shall be properly labeled, handled, and stored.

Each employee can best determine where simple housekeeping can be applied for effective minimization.

4.5 Segregation

Certain materials coming onto an IPF site will possess inherently great hazards (e.g., higher concentrations of more undesirable constituents). These should not be mixed with other materials that are non-hazardous, less hazardous, or may otherwise be recycled in some manner. The following examples will guide employees in any minimization efforts:

- Do not mix hazardous wastes with other non-hazardous materials.
- Oil or solvent contaminated rags should be separated from non-hazardous refuse. These rags

must be wrung out and free from any liquid that can be squeezed from them.

- Keep spent solvents of differing makeup separated from each other (i.e., halogenated from non-halogenated) and other wastes in order to facilitate recycling efforts.

4.6 Consolidation

Consolidation is the reduction in number of different types and brands of materials and mixtures coming on site.

- 4.6.1 The materials that have a lower inherent hazard should be favored. For instance, two or three cleaners may do the job of the twelve that are stocked. Chemicals received in both drums and gallon containers may best be handled in one size only, allowing the removal of unneeded containers.
- 4.6.2 Low cost/price hazardous material is not necessarily the best buy. The total cost of the product from purchase through waste disposal must be considered, as should all safety factors for excessively hazardous material.

4.7 Process Changes

This entails the refining of the waste generating process to produce less (or less hazardous) waste. This can include adding filters to an oil system to increase oil life, revising a chemical process to avoid forming certain byproducts, or changing an operation in some way that will reduce spills and leaks.

4.8 Recycling

Recycling can include on site or off site recycling. The preferable method would be on site due to reduced costs, handling, and transportation liabilities. Off site recycling requires the use of a vendor. Yet, this

is often preferable to land filling or other disposal options. If a hazardous material must be used, thought should be given to the recyclability of the product.

NOTE: Other minimization options should be explored in conjunction with recycling to reduce the amount of waste that needs recycling.

4.9 Substitution

Product substitution involves either using a less toxic or less waste producing product that still does the job, or providing an equivalent product for purposes of competitive bidding. Employees who stay alert to product developments can best start a process of substitution. Recommendations for product substitution will be reviewed by Environmental and Safety following procedures outlined in Sections 5.0 through 5.9, and forwarded to the Hazardous Material Minimization Committee.

- 4.9.1 If an alternate product for substitution and replacement is approved, the old product will either be used up or deleted and removed from stock. It will be temporarily stored at the Hazardous Waste Storage Building until a final determination is made on how to deal with it.
- 4.9.2 Hazardous material stock substitutions, deletions, and reductions will be authorized only through the Hazardous Material Minimization Committee and/or Staff.
- 4.9.3 The choices for disposition of substituted material will include:
 - **Use** - The Environmental and Safety Sections will determine if other possible uses of the product are available. Safe use will be the key factor.
 - **Salvage** - The Waste Minimization Committee will review the possibility of salvaging bulk

material from stock. If appropriate, the Waste Minimization Committee will make a recommendation to the Salvage Committee. The Salvage Committee will determine if value can be received for material removed from stock. A successful bidder on such substances will be required to meet stringent financial responsibilities.

- **Dispose** - The material will be discarded following applicable regulatory codes.

NOTE: Not all of these options may be considered for all wastes. For instance, the only choice for extremely hazardous materials would be disposal to remove its presence from the workplace.

4.9.4 Hazardous materials (any element, chemical compound or mixture of elements in gas, liquid, solid or powder form, and under OSHA requirements) must have a Material Safety Data Sheet (MSDS) on file and be reviewed by the Safety and Environmental Sections prior to purchase for product substitution.

4.10 Elimination

Frequently, products become obsolete or are no longer needed in the workplace. If an employee finds that a particular product can no longer be used, that item should be removed from stock and its stock number deleted. It can then be disposed of or salvaged as discussed in Section 4.9.3.

4.11 Liability

The potential exposure to civil and criminal liability stemming from mismanagement of hazardous materials and wastes can be considerable. This exposure can be found at both the corporate and personal level. IPSC expects compliance with the procedures outlined in this PAI to

lessen its liability. Circumvention of these procedures will increase your personal liability.

5.0 Purchasing Control of Hazardous Material

Many products that IPSC acquires contain hazardous materials. Therefore, it is important that careful consideration be given to the selection, requisitioning, and purchasing of chemical products (solvents, acids, cleaners, paints, etc.) in order to minimize exposure of their hazards to IPSC employees.

5.1 Chemical Usage

Any chemical product approved for use at IPSC will be put on an approved chemical list. This list is the MPAC Stores Inquiry Menu on PRIME. A hazardous material is approved if the material has a stock number in MPAC stores, including ORO and Min/Max.

5.1.1 Approved materials in MPAC will be regularly reviewed by the Hazardous Material Minimization Committee.

5.1.2 Chemical products not in MPAC stores shall not be purchased except as specifically allowed by this PAI. This includes products purchased on a direct basis and have never been entered into stock. Chemical products falling in this category will be forced through the approval process described below. This will ensure that all chemical products are controlled and tracked.

5.1.3 Hazardous materials that are provided in several different sized containers should have a distinct stock number for each size issued. Requests for larger containers require approval and if approved, must have new stock numbers issued.

5.2 Ordering Pre-Approved Hazardous Materials

- 5.2.1 Pre-Approved products are defined as those which are currently used and are listed on the current approved chemical list (as found on MPAC Stores Inquiry Menu).
- 5.2.2 The requestor shall verify that the required chemical materials appear in MPAC stores, and that an associated MSDS is in CHEM LOG. If they are not, see Section 5.3.

5.3 Purchasing Non-Approved Hazardous Materials

- 5.3.1 The requestor shall fill out "Recommendation of New Hazardous Material" form (Exhibit #1) and secure the product MSDS through the vendor, purchasing, or other source.
- 5.3.2 In completing this form, solid justification for the use of the product must be provided. This must include whether the product being requested will replace another product in stock and if not, provide the reasons why it will not.
- 5.3.3 If the product requested is to be used on an ongoing basis, then the requestor must include a "Min/Max/ORO Request/Change/Establish" form with the request in order to place the product in MPAC stores as an approved material.
- 5.3.4 When an existing MPAC stores item is to be replaced by the new material, the requestor shall also include "Stores Data Change Request" for the stock item to be replaced. The change request should stop all future purchases, and provide that the stock item be deleted when used up. Occasionally, the degree of hazard will require the replaced item to be removed from stock immediately and disposed of. This information needs to be put on the "Stores Data Change Request."

- 5.3.5 The requestor shall submit MSDS and recommendation form to the Safety and Environmental Sections for evaluation and recommendations for approval or rejection.
- 5.3.6 Safety and Environmental Sections will forward the request along with recommendations to Staff for final determination.
- 5.3.7 If approved, the hazardous material will be added to the approved chemical list (MPAC) following Reference 5.2 if the request was accompanied by a "Min/Max/ORO/Request/Change/Establish" form. Otherwise, if approved for one time usage, Purchasing will receive a copy of the approved request for a single purchase.
- 5.3.8 If rejected, the request and reason for rejection will be returned to the requestor, and the requestor must seek an alternate product. If an alternate product cannot be found, Safety, Environmental, requestor, and Department Head will re-evaluate the product. The product requested may be used with Staff approval if an alternate product is not available. Safety and Environmental will make recommendations on the product's usage based on MSDS information.
- 5.3.9 If alternate materials are found, follow Sections 5.2 or 5.3, whichever is applicable.
- 5.3.10 If an emergency arises requiring immediate action on a hazardous material purchase, the request can be hand carried through the process described above.
- 5.3.11 Copies of the approval will be provided to the requestor, Purchasing, Environmental, Warehouse Sections (if put in MPAC), and to Safety (with MSDS attached).

5.4 Purchasing Procedures

5.4.1 All hazardous materials shall be purchased by the Purchasing Section.

5.4.2 The Purchasing Section shall follow these steps when a chemical product requisition has been received:

5.4.2.1 Check to see if the product is in MPAC stores or if an approved one-time-use or special project (see Section 5.5.6) request is on file.

5.4.2.2 If the product is not in MPAC stores or on file as a one-time or special project purchase, Purchasing shall reject the purchase request and return it to the requestor for proper approvals.

5.5 Exceptions and Exemptions

5.5.1 Certain materials are purchased that do not present a significant hazard to employees. Products such as those designed for human consumption or application may be processed and purchased somewhat differently. These include hand lotions, analgesics, salves, thirst quenchers, etc.

EXAMPLE: For instance, a saline solution used for irrigation of eyes would not constitute a hazardous material.

NOTE: For guidance, reference 29 CFR 1910.1200 (b) (6) (i-viii) and 1910.1200 (see Exhibit #3).

5.5.2 Other products are sometimes requested that are identical to materials already in stock, but differ in some aspect that does not make them any more hazardous. Examples include

lubricating oils of the same type and name, paints of the same brand that only differ in color, or approved substances to be purchased in smaller containers.

EXAMPLE 1: IPSC has several Carboline 134 paints in stock. These are used throughout the plant site in various colors. If a different color in Carboline 134 was needed, the base components do not change, only a pigment is changed. Any hazard is also normally unchanged. (However, some pigments may contain heavy metals that may still require approval (see Section 5.5.3 below.)

EXAMPLE 2: A material used by different departments is being purchased in one size only, say, 55 gallon drums. This size may be inconvenient for another department's needs. A request to purchase smaller quantities of the same product may be exempt if hazards do not change.

- 5.5.3 IPSC has been provided with a specification that spells out specific chemical coatings and paints for corrosion control. These coatings are listed in the IPP/IGS Specialty Coating Design Summary supplied by Black and Veatch. These listed chemicals can be purchased in small quantities (one gallon or less per part) for patching purposes only. The product must be the exact specified coating, and must be identical to what is already applied on the specified system. No substitutions!
- 5.5.4 How To Exercise An Exemption - The situations above may preclude Staff approval. However, these must still be reviewed by both Safety and Environmental to ensure tracking. The requestor may still need to fill out a "Recommendation of New Hazardous Material" form for record keeping. To exercise an exemption:

- Obtain an MSDS or product description.
- Have Safety review for OSHA & safety/health considerations (can be verbal).
- If Safety determines no MSDS is required under OSHA, complete the purchase. Otherwise, contact Environmental for review.
- If Safety and Environmental feel that the material request fits the criteria above, the requestor may requisition the item. Environmental will advise Purchasing and Warehouse Sections in writing of their determination.
- Any request not exempted as above must be provided for Staff approval on the proper forms.
- A summary of products purchased under these exemptions shall be provided to Staff for review. Staff can exercise retractions of exempt status.

5.5.5 Some items are purchased at local stores through a requisition release. Materials bought in this way may bypass approval if:

- The material is strictly a household product in normal household sizes and packaging. Items normally sold for commercial or industrial applications must be approved prior to purchase.
- An MSDS is ordered at the time of purchase, and sent to Safety's attention. Remember, a vendor is required to provide the MSDS to you. Be sure to retain a copy of the MSDS for your own reference.
- Safety and Environmental Sections are notified of these purchases by the requestor.

5.5.6 A single request for new hazardous material may be submitted for special projects approval. In order to keep the presence of hazardous materials to a minimum during a project, smaller amounts can be purchased in succession without the need to re-submit a new "Recommendation of New Hazardous Material" form or place into Min/Max or ORO. This is for single one time projects only. Materials approved for one project cannot be purchased for another under the same "Recommendation of New Hazardous Material" form.

5.6 Materials Used by Contractor

5.6.1 For materials ordered through or used by an outside contractor, the contract shall include the following language or similar language appropriate to the location or nature of the work:

"Hazardous materials purchased by the contractor for use at Intermountain Power Facility (IPF), as a consequence of working for IPSC, or other on site contractor, shall require approval by the Contract Administrator. The contractor shall submit to the IPSC Safety and Environmental Sections a detailed listing of materials to be used on the job and the applicable MSDSs prior to the use of the materials. No hazardous materials shall be used by a contractor at IPF unless they have been approved by both the IPSC Safety and Environmental Sections. Similarly, the contractor must:

- Train all potentially exposed site personnel on the MSDS and hazards for each hazardous material used on the job site and in the vicinity.
- Provide protective equipment to potentially exposed personnel.

- Provide proper management of all hazardous materials and/or wastes as specified by the Utah Bureau of Solid and Hazardous Wastes, EPA Region VIII, and IPSC policy. Such activity, especially concerning any disposal, shall be overseen by IPSC Environmental Services."

5.6.2 The Contract Administrator must determine which IPSC employees may be potentially exposed to hazardous materials used by contractors. The Contract Administrator must also ensure that these IPSC employees review the MSDS with their supervisors and the contractor.

5.6.3 The Contract Administrator must also involve the IPSC Environmental Section in management of all contractor wastes. EPA recognizes waste generation by site, not by company name. Therefore, IPSC is responsible for proper management of all waste activities. The Environmental Section can provide assistance in evaluation, identification, and accumulation of contractor waste, including contractor training, providing containers and labels, and oversight of waste handling.

5.7 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) provided to IPSC shall meet government regulations; copies can be obtained through Safety and through the PRIME computer CHEM LOG Program.

5.7.1 To ensure that users of hazardous materials are receiving the appropriate MSDS, Safety and Environmental shall:

- Review any MSDS for hazardous materials prior to purchase or use by IPSC. For any MSDS that does not conform with Occupational Safety and Health Administration and Environmental Protection Agency requirements,

Safety shall notify the manufacturer and users at IPSC.

NOTE: See IPSCs "Written Hazard Communication Program", PAI #92.

- Coordinate with the IPSC Hazardous Material Minimization Committee (see Sections 4.2.3, 4, and 5) to review the list of IPSCs inventory of hazardous materials and ensure a current MSDS is available for each material. Updating and distribution will be done by the Safety Section. CHEM LOG will also be updated accordingly through the Clerical Pool.

5.8 MPAC Stores Stock Number Management

- 5.8.1 When dealing with stock items (Min/Max or ORO), no hazardous material shall be purchased for warehouse stock unless the item is specifically listed in MPAC stores by name and description. MPAC stores descriptions or purchasing specifications may not be changed to accommodate hazardous material changes without approval (see PAI #41, "Initiating and Changing Min/Max Stores Levels", Section 4.5.7). For instance, changes to descriptions for product substitution, equivalent bidding, or product replacement are not to be made without following all of the provisions of Section 5.0 of this PAI.

5.9 Receiving Hazardous Products

- 5.9.1 The warehouse shall not issue non-approved hazardous material to requestors. The warehouse can verify approval through purchase order information. If the material received does not match the description on the purchase order, the warehouse will complete an OS&D and hold until cleared by Purchasing, Safety, and Environmental.

5.9.2 If no requisition or purchase order can be found for received hazardous material, the warehouse shall hold material and follow OS&D procedures per PAI #44, "Warehouse Receiving Procedures". The warehouse may also contact Safety or Environmental who will contact intended recipient, or shipper, for details and approval.

- The warehouse may also receive shipments for contractors. These materials may only be released through the Contract Administrator who shall verify that the shipment meets the requirements of Section 5.6 of this PAI.

5.9.3 Receiving will verify that chemical products received have product labeling in accordance with OSHA standards. Environmental or Safety will assist Receiving in verifying that labels meet standards (see "Hazardous Material Labeling", PAI #152).

5.9.4 IPSC personnel are occasionally offered samples of hazardous materials. Always ensure an MSDS accompanies these samples at all times, and notify Safety and Environmental of their presence. If the vendor does not have an MSDS, the material must be refused.

6.0 Waste Management

Pollution prevention and waste minimization cannot be over emphasized. However, some hazardous material will end up as waste. Hazardous material that is generated as waste will be handled under a waste management plan administered through the Environmental Section (refer to PAI #106, "Hazardous Material and Waste Management Procedures").

Routing If Approved—

Original With MSDS: Safety, New Stock # _____
Copies: Purchasing
Environmental
Warehouse
Requestor

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EXHIBIT #1

Recommendation of New Hazardous Material

Requestor: _____ Telephone Extension: _____

Requestor's Supervisor: _____ Product #: _____

Name of Product: _____ Manufacturer: _____

NOTE: MSDS must be attached. (If emergency, get fax of MSDS and walk through.)

Intended Use(s): _____

Describe application and environment/area of use: _____

Number of people to use this product: _____ Craft/Dept: _____

Where and how will it be stored? _____ Quantity: _____

Will this item be placed in MPAC Stores? _____ ☐ Min/Max ☐ ORO
(If so, attach "Min/Max/ORO Request/Establish/Change" form)

Is a similar product already in MPAC Stores? _____ Stock #: _____

Why can't it be used? _____

Will this product replace or substitute the MPAC Stores item above? _____

If not, explain: _____

Justification for this product: _____

Requestor Signature _____ Date _____

Supervisor Signature _____ Date _____

Safety Recommendation: ☐ OK To Use

☐ Do Not Use

Reason: _____

Environmental Recommendation: ☐ OK To Use

☐ Do Not Use

Reason: _____

Safety Signature _____ Date _____

Environmental Signature _____ Date _____

Staff Approval:

☐ Yes, return to Safety with MSDS. Copy to Requestor, Environmental, Warehouse (if stocked), and Purchasing.

☐ No, return to Requestor. Copy to Environmental and Safety.

Reason Approved or Not Approved: _____

Staff Approval Signature _____ Date _____

EXHIBIT #2

PURCHASING HAZARDOUS MATERIALS

(PAI #144 Section 5.0)

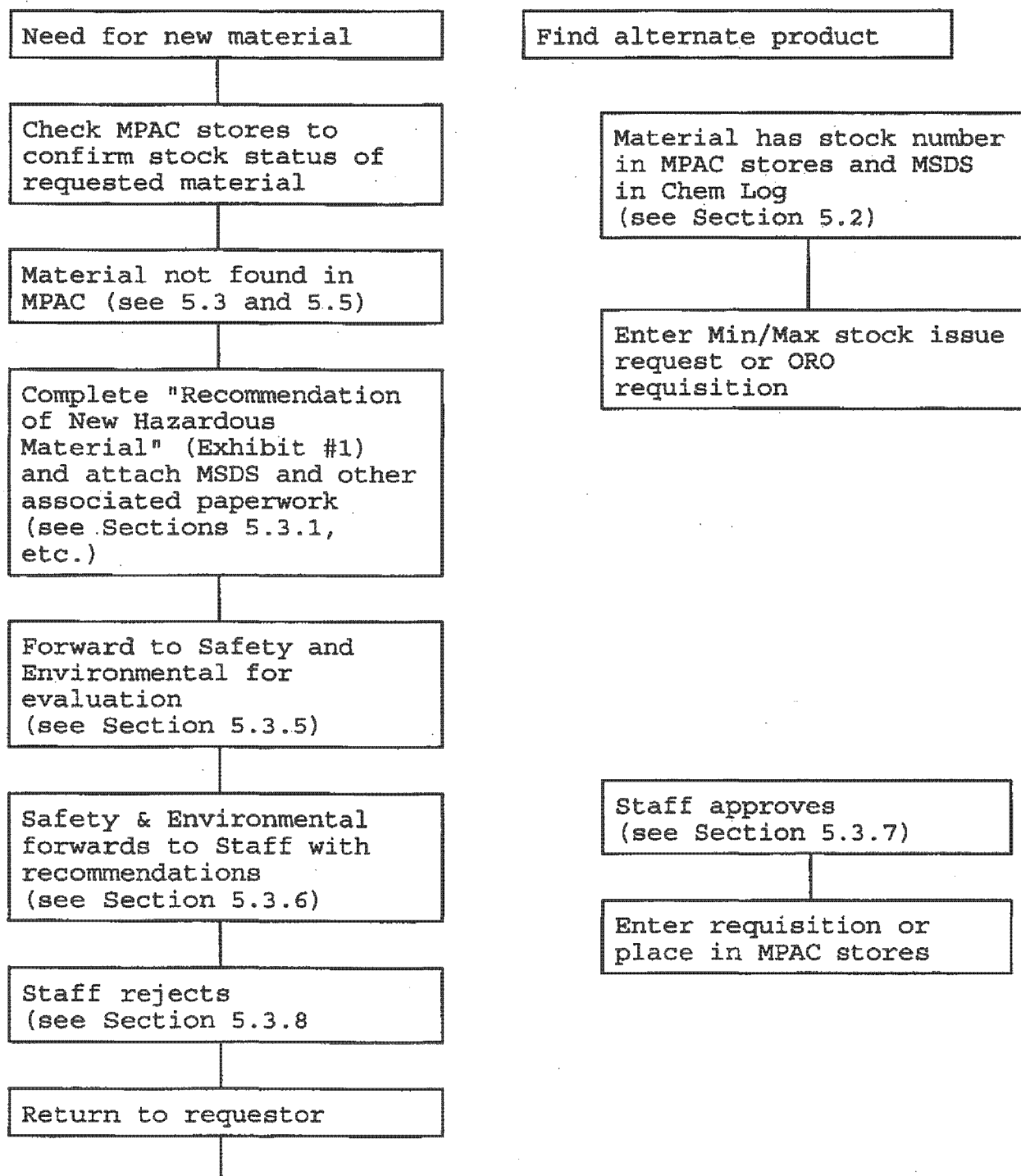


EXHIBIT #3

OSHA HAZARD COMMUNICATION STANDARD

This is a guidance document to help you determine if an MSDS and approval is necessary. See Section 5.5.1 of this PAI.

Section: 1910.1200

Reference: Title 29 | Part 1910 | Subpart Z

- (b) (6) This section does not apply to:
 - (I) Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency;
 - (ii) Tobacco or tobacco products;
 - (iii) Wood or wood products;
 - (iv) Articles (see definition below);
 - (v) Foods, drugs, cosmetics, or alcoholic beverages in a retail establishment which are packaged for sale to consumers;
 - (vi) Foods, drugs, or cosmetics intended for personal consumption by employees while in the workplace;
 - (vii) Any consumer product or hazardous substance, as those terms are defined in Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 12061 et seq.) respectively, where the employer can demonstrate it is used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers; and
 - (viii) Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) when it is in solid, final form for direct administration to the patient (i.e., tablets or pills).

Definitions. "Article" means a manufactured item:

- (I) Which is formed to a specific shape or design during manufacture;
- (ii) Which has end use function dependent in whole or in part upon its shape or design during end use; and
- (iii) Which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

EXHIBIT #4

HAZARDOUS WASTE MINIMIZATION PLAN

Facilities: Intermountain Generating Station (IGS)
Intermountain Converter Station (ICS)
Railcar Service Center (RSC)

Company: Intermountain Power Service Corporation

Address: 850 West Brush Wellman Road
Delta, Utah 84624-9546

<u>Revision</u>	<u>Date</u>
<u>0</u>	<u>10/23/90</u>
<u>1</u>	<u>12/30/91</u>
<u>2</u>	<u>3/26/93</u>
<u>3</u>	<u>3/26/94</u>
<u>4</u>	<u>3/18/95</u>
<u>5</u>	<u>3/27/96</u>

IP7012098

I. Introduction

The Intermountain Power Facilities (IPF) consists of the Intermountain Generating Station (IGS), the Intermountain Converter Station (ICS), and the Railcar Service Center (RSC).

This plan was prepared in accordance with the Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act. The Plan's purpose is to direct and document our efforts to reduce the volume, quantity, and toxicity of hazardous waste where economically feasible. Efforts to reduce hazardous wastes consist of the following programs in order of priority:

- Source Reduction
- Product Substitution
- Reuse
- Recycling
- Energy Recovery
- Treatment

In addition, this plan identifies specific sources of the hazardous wastes generated at the facility and evaluates methods of reducing or eliminating these wastes.

II. Target Waste Streams

An estimated annual volume or weight of hazardous and non-hazardous wastes that require special handling by IPF is given below:

	WASTE	QTY. UNIT	1991	1992	1993	1994	1995
a.	Anti-freeze ¹	Gal.	55	600	2,100	2,900	1,075
b.	Batteries						
	Lead Acid	Lbs.	4,200	6,100	5,400	6,800	4,200
	Lithium	Lbs.	30	10	1	1	1
	Nickel Cadmium	Lbs.	10	25	25	65	25
c.	Mercury	Lbs.	<1	0.00	1	1	1
d.	Safety Kleen Solvent ²	Lbs.	30,550	20,900	43,400	22,700	2,024
e.	Toluene (Lab Wastes)	Lbs.	433	75	110	130	87
f.	Used Oil/Grease ³	Gal.	31,207	19,200	36,400	19,800	13,200
g.	Waste Paints ⁴	Lbs.	6,540	6,310	4,120	6,300	2,770
h.	Waste Cleaners ⁵	Lbs.	4,597	210	11,700	380	120
i.	Asbestos ⁶	Lbs.	1,050	350	200	600	220
j.	Labpack, Off-Spec, & Outdated Chemicals	Lbs.	----	----	19,700	2,450	1,155

¹ Antifreeze is not listed or characterized as a hazardous waste.

² Safety Kleen solvents include both hazardous and non-hazardous wastes.

³ Utah Division of Hazardous and Solid Waste does not classify EPA on-spec used oil as hazardous.

⁴ Includes associated thinners and solvents.

⁵ Includes halogenated hydrocarbons.

⁶ Classified as special waste.

III. Target Activities/Operations

The activities, processes, or operations which generate these wastes or waste streams are as follows:

- Anti-freeze is mostly of the glycol coolant type used in vehicles and building heat exchangers.
- Batteries are used in vehicles, plant instrumentation, and essential services power sources.
- Mercury is used in manometers, thermostats, and level switches.
- Safety Kleen solvent is used primarily for cleaning equipment and parts. There are 11 cleaning stations throughout IPF.
- Toluene is used for lubrication oil analysis in the fuels laboratory.
- Used oil and grease are from vehicles, pumps, motors, etc.
- Florescent tubes and mercury lamps are used plant-wide for lighting.
- Waste paints are generated at the painting shop.
- Asbestos contaminated material is generated by gasket installation and removal, or brake shoe replacement.
- As chemicals age past expiration dates, they are lab packed or otherwise managed.

IV. Evaluation of Waste Minimization Options

Anti-freeze is either recycled or is beneficially used on site. Lead acid batteries, and Safety Kleen solvent are presently being recycled by their respective manufacturers. Lithium and nickel cadmium batteries and mercury wastes are being accumulated at points of generation, and reclaimed off site. Toluene and waste paints are being fuel mixed for energy recovery off site. Used oil is burned with coal in boiler furnaces. Asbestos is land filled on site in a state

approved landfill. Lab packs and off-spec chemicals are incinerated or stabilized and land filled.

V. Preferred Options

The preferred minimization options for generated wastes at IPF are as follows:

- Lithium and nickel cadmium batteries are reclaimed off and the components recycled.
- Mercury will be cleaned and recycled off site at approved facilities.
- Toluene and waste paints: We currently have a contract with Van Waters & Rogers to incorporate the waste toluene and paints into the Chemcare Program. These wastes will be fuel mixed and incinerated.
- Used oil: Oil is being metered out on the active coal reclaim and burned. Grease is shipped off site for energy recovery.
- Florescent tubes and mercury lamps are being accumulated for recycling.
- Cleaning solvents used under the Safety Kleen program are being recycled as required by contract. Aqueous washers have been installed to reduce Safety Kleen waste.
- IPP has a state approved landfill on site with a portion segregated for asbestos disposal.
- Oil filters are punctured and hot drained or sent off for recycling.
- Spent glycol products are reused when possible, including coal belt dust suppression and de-icing.

VI. Recommendations

- Show strong and continued support for the existing plan.
- Provide environmental education and training for employees.

- Encourage participation and suggestions to improve the plan.
- Provide motivation and incentive programs.

These may include:

- Videos which show the impact of hazardous waste on the environment.
 - Informing the employees of the cost of hazardous waste disposal.
 - Rewarding and/or recognizing individuals for ideas suggested which have been successfully implemented and maintained.
 - Rewarding and/or recognizing individuals who implement the projects and make them succeed.
 - Studying the success of other hazardous waste minimization plans.
- Keep an accurate accounting system to track types and amount of hazardous wastes generated. This will aid in checking the success of current minimization efforts.
 - Perform occasional environmental audits to determine risk assessment and compliance.
 - Revise accounting methods so that all costs of managing wastes are charged to the departments generating the wastes.

VII. Implementing Plan

- Training
 - Communicate the reasons behind hazardous waste minimization to employees (safety, cost savings, and less environmental impact or risk).
 - Review this plan with every employee handling hazardous waste.

- Provide training required to properly handle and segregate hazardous waste.
- Review
 - Before starting a new work procedure, review for applicable waste segregation, etc. This can be done in conjunction with review of safety procedures.
 - Review this plan once every calendar year and revise every three years.
 - Ask for and act on suggestions from employees between annual reviews.
- Goals
 - Many methods of hazardous waste minimization are already in place. A continual effort will be made to ensure that source reduction, substitution, and recycling are being implemented where feasible and economically practical.
- Specific procedures for implementing this plan and the above items are found in PAI #144, "Minimization and Control of Hazardous Materials and Waste."

INTERMOUNTAIN POWER FACILITIES

Hazardous Waste Minimization Plan

Developed by: Environmental Section, Laboratory Services

Department: Technical Services

I have the authority to commit the necessary resources to implement this plan. This plan is hereby fully approved and will be implemented as herein described.

Signature: _____ Date _____

Name: S. Gale Chapman

Title: President and Chief Operations Officer

JOB PACKAGE #1**Capital Project IGS02-07 Induced Draft Fan Variable Frequency Drives**

Project Description: IPSC is replacing the induced draft fan variable frequency drives. There are four (4) induced draft fans for each generating unit. Each fan is driven by a 7,500 HP synchronous motor supplied by two (2) variable frequency drives. Both the variable frequency drives for the Unit 2 D fan were replaced in March 2004. This Job Package covers replacing the Unit 1 C and D fan variable frequency drives in March 2005. A total of four (4) drives will be replaced.

Documentation: Contractor shall be responsible to provide undated "as-built" copies of the construction drawings for all installed equipment and wiring.

Scope of Work:

1. Install new 120-volt power cable from the essential services power panels in the Generating Station Control Building to the new drives using existing cable tray, duct bank, and wireway. New cable will be installed for all eight (8) Unit 1 variable frequency drives. The power cables for the Unit 1 A and B drives will be coiled, in the cable tray under the drives, until the new drives are installed in March 2007. The cable for the Unit 1 C and D drives will be connected when the new drives are installed. The cable must be installed but not connected at either end before February 20, 2005. The cable is 3-conductor #8 tray cable with a separate ground conductor. The cable shall be routed to match the existing 2-conductor #12 tray cable routing for circuits 1CCEK2121B13, 1CCEK2122B13, 1CCEK2123B13, 1CCEK2124B13, 1CCEK2125B13, 1CCEK2126B13, 1CCEK2127B13, and 1CCEK2128B13.
2. Carefully identify and label all circuits, including the high-voltage circuits between the drive cabinets and the transformer, from the drive motor operated switch and between the drive and motor, connected to the existing Unit 1 C and D drives, and then disconnect the circuits and carefully coil them in the cable trays located under the drives. The inspection and labeling of control and low voltage power (< 480-volt AC) circuits may be completed before the existing drives are removed from service on February 26, 2005. The cables may be disconnected, after the proper authorizations are obtained, on February 26, 2005 beginning at 7:00 a.m.
3. Disconnect the existing heating and ventilating duct and fabricate new sheet metal covers to close the unused openings.
4. After all the cables and duct have been removed, disassemble and remove the existing drives. The existing drive dimensions and weights are shown on drawing 63.2203.05-90025. Contractor shall carefully remove the drives and transport them to a warehouse at the Generating Station site.
5. Load, transport, and install the new drives. The new drives are being stored at the same warehouse where the removed drives will be unloaded. The new drives shall be carefully assembled and leveled by install shims between the concrete floor and drive cabinet floor rails.

JOB PACKAGE #1

6. Reconnect the circuits except for the circuits to the annunciator and the trip panel. The circuits to the annunciator and trip panel shall be modified as shown on the drawings.
7. Install two (2) new control circuits between the two (2) drives for each fan. These circuits shall be installed in the existing cable tray below each drive. The cable for these control circuits is 7-conductor #14 tray cable.
8. Replace I/O modules in the programable logic (Modicon) cabinet and modify the internal cabinet wiring as shown on the drawings.
9. Disconnect the isolation transformer temperature indication circuits to the annunciator and rewire the circuits to the variable frequency drive regulator cabinet.
10. Install one (1) new power circuit from each drive to an adjacent (within the same room) motor control center. Each circuit shall be installed in the existing cable tray below each drive. The cable for each power circuit is 5-conductor #12 tray cable.
11. Install one (1) new current sensing relay in each of the 6,900-volt circuit breakers supplying the drives. Modify the wiring as shown on the drawings using #14 SIS wire.
12. Carefully verify the new drives are wired correctly and all cables are labeled, and provide as-built drawings of the new wiring. The installation of the new drives must be completed by March 3, 2005.
13. Install a junction box, conduit, and wiring for a new motor shaft mounted encoder for the fan drive motors. Mount the motor shaft encoder and support testing of the encoder. This Work must be completed by February 15, 2005. Except for the final terminations, the installation of the junction box, conduit, and new cables for the encoder can be completed in January or early February. The new cables shall consist of 4-pair #16 tray cable approximately 500 feet in length for each encoder. Except for approximately 20 feet of new conduit, this cable shall be installed in the existing raceway.
14. Provide start-up support for the drives. Assume thirty (30) hours of start-up support for each drive. This amount will be adjusted based on the time and material rates submitted in the bid to cover actual hours.

Materials Supplied by Owner:

1. Variable frequency drive assemblies - two (2) for the Unit 1 C ID fan and two (2) for the Unit 1 D ID fan.
2. 7-conductor #14 tray cable.
3. 5-conductor #12 tray cable.
4. 4-pair #16 tray cable.
5. 3-conductor #8 tray cable.
6. Two (2) encoder assemblies and associated junction boxes.
7. Four (4) current sensing relays.
8. PLC (Modicon) I/O modules.

JOB PACKAGE #1

Reference Drawings:

DRAWINGS	
UNIT 1 VARIABLE SPEED DRIVE 1A	UNIT 1 VARIABLE SPEED DRIVE 1B
1CCE-K2121B	1CCE-K2123B
1CCE-K2122B	1CCE-K2124B
UNIT 1 VARIABLE SPEED DRIVE 1C	UNIT 1 VARIABLE SPEED DRIVE 1D
63.2203.05-90025	1EEC-E3327
1CCE-K2103C	1EEC-E3511
1CCE-K2115A	1EEC-E3512
1CCE-K2115C	9EEC-E2314
63.3601.05-90233	9EEC-E3250
63.3601.05-90156	63.2203.05-90025
1CCE-K2116A	1CCE-K2104C
1CCE-K2116C	1CCE-K2117A
1CCE-K2125B	1CCE-K2117C
1CCE-K2126B	63.3601.05-90233
1CCE-K2133	63.3601.05-90156
1CCE-K2601	1CCE-K2118A
1CCE-K2604	1CCE-K2118C
1CCE-K2606C	1CCE-K2127B
1CCE-K2806A	1CCE-K2128B
1CCE-K2807B	1CCE-K2134
63.2203.1.05-900041 (Alstom 2000-8100-01)	1CCE-K2601
63.2203.1.05-900042 (Alstom 2000-8100-02)	1CCE-K2605
63.2203.1.05-900043 (Alstom 2000-8100-03)	1CCE-K2606C
63.2203.1.05-900044 (Alstom 2000-8100-04)	1CCE-K2808A
63.2203.1.05-130000 (Alstom 2001-001C)	1CCE-K2808B

JOB PACKAGE #1

DRAWINGS	
63.2203.1.05-900009 (Alstom 2001-002)	63.2203.1.05-900041 (Alstom 2000-8100-01)
63.2203.1.05-900020 (Alstom 2001-010)	63.2203.1.05-900042 (Alstom 2000-8100-02)
63.2203.1.05-130001 (Alstom 2001-014A)	63.2203.1.05-900043 (Alstom 2000-8100-03)
63.2203.1.05-130002 (Alstom 2001-014B)	63.2203.1.05-900044 (Alstom 2000-8100-04)
63.2203.1.05-130003 (Alstom 2001-014C)	63.2203.1.05-140000 (Alstom 2001-001D)
63.2203.1.05-130004 (Alstom 2001-014D)	63.2203.1.05-900009 (Alstom 2001-002)
63.2203.1.05-130005 (Alstom 2001-014E)	63.2203.1.05-900020 (Alstom 2001-010)
63.2203.1.05-900046 (Alstom 2001-8301-1)	63.2203.1.05-140001 (Alstom 2001-015A)
63.2203.1.05-900047 (Alstom 2001-8301-2)	63.2203.1.05-140002 (Alstom 2001-015B)
63.2203.1.05-900048 (Alstom 2001-8301-3)	63.2203.1.05-140003 (Alstom 2001-015C)
63.2203.1.05-900049 (Alstom 2001-8301-4)	63.2203.1.05-140004 (Alstom 2001-015D)
63.2203.1.05-900050 (Alstom 2001-8301-5)	63.2203.1.05-140005 (Alstom 2001-015E)
63.2203.1.05-900058 (Alstom 2001-8303)	63.2203.1.05-900046 (Alstom 2001-8301-1)
63.2203.1.05-900023 (Alstom 2001-021)	63.2203.1.05-900047 (Alstom 2001-8301-2)
	63.2203.1.05-900048 (Alstom 2001-8301-3)
	63.2203.1.05-900049 (Alstom 2001-8301-4)
	63.2203.1.05-900050 (Alstom 2001-8301-5)
	63.2203.1.05-900058 (Alstom 2001-8303)
	63.2203.1.05-900023 (Alstom 2001-021)

JOB PACKAGE #2

Capital Project IGS03-09 U1 Flame Scanner Replacement Upgrade

Project Description: IPSC is replacing the flame scanner system on forty-eight (48) burners in Unit 1. There are twenty-four (24) burners on each side of the boiler. This involves removing the old scanners, amplifier junction boxes (JBXs), installing new JBXs on the burner levels and new amplifier cabinets (Cab) in relay room, pulling cables from existing Cab-1 Sec-6 to each burner JBX and to the new scanner amplifier Cab-32 & 33.

Documentation: Contractor shall be responsible to provide undated "as-built" copies of the construction drawings for all installed equipment and wiring.

Unit 2: Upgrading the amplifiers in Cab-32 & 33 on Unit 2 during short Outage.

Unit 2 Scope of Work (February 13-17, 2005 Outage):

1. Replace amplifiers in Unit 2 Cab-32 & 33. Re-terminate wiring in Cab-32 & 33.
2. Install twenty-four (24) new dual channel amplifiers pre-mounted in panels in Cab-32 & 33.
3. Redo internal Cab-32 & 33 wiring from TB to amplifier TB, approximately twenty (20) terminations per scanner = nine hundred and sixty (960) terminations.
4. Pull eight (8) additional cables (3PR 16) between Cab-32 & 33 and Cab-1 Sec-6, approximately 50 feet.
5. Terminate in Cab-1, Sec-6.
6. Mount bar meters in Cab-1 thru 16 on burner levels; install wiring from meters to TB as per drawings = twelve (12) terminations.

Unit 1 Scope of Work (March 2005):

1. Remove forty-eight (48) existing amplifiers from Cab-32 & 33.
2. Remove existing flame scanner amplifier JBXs and supports located on burner levels Cab-1 thru 16.
3. Mount three (3) meters and three (3) TBs in each JBX 1 thru 16.
4. Weld new cabinet supports. Mount sixteen (16) new scanner JBXs on burner level, Cab-1 thru 16.
5. Core drill two (2) 4-inch diameter holes through the concrete floor into the cable spreading room under each amplifier cabinet.
6. Mount pre-assembled flame scanner cabinets in relay room and install two (2) terminal block panels in each cabinet.
7. Install fire block in holes under amplifier cabinet.
8. Upsize sixteen (16) conduits from burner front JBX to 1" LB from 1 inch to 1.5 inch, each approximately 20 feet long.
9. Pull sixteen (16) cables (4-pair) from Cab-32 & 33 to Bailey Cab-1 Sec-6, approximately 50 feet.
10. Pull forty-eight (48) cables (2-pair) from Cab-32 & 33 to Burner level JBXs, approximately 450 feet.
11. Pull forty-eight (48) pre-built scanner cables from burners to burner level JBXs, approximately 50 feet.

JOB PACKAGE #2

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12. Terminate cables in JBXs, Bailey Cab-1 Sec-6 and Cab-32 & 33.
 13. Carefully insulate and terminate shields as per drawings.
 14. Label cabinets, cables, and conduits.

Materials Supplied by Owner:

1. Twisted shield 16-gauge cables: 28,000 feet of 2-pair, 400 feet of 3-pair, and 16,800 feet of 6-pair.
2. Sixteen (16) junction boxes on burner deck (contain three {3} TBs and three {3} meters).
3. Ninety-six (96) analog bar meters.
4. Forty-eight (48) terminal blocks 12-point.
5. Forty-eight (48) scanner assemblies to be mounted in existing pipes on burners.
6. Twenty-four (24) ABB FAU amplifiers pre-mounted in Cab-32 & 33.
7. Four (4) termination panels with 150 Phoenix slide link TBs to be mounted in Cab-32 & 33.

Reference Drawings:

1SGA-K2801A_R002 Schematic Diagram Flame Detector Wiring A-D.dwg
 1SGA-K2801B_R002 Schematic Diagram Flame Detector Wiring E-H.dwg
 1SGA-K2855A Front Flame Scanner CAB 32 TB1 Wiring Diagram.dwg
 1SGA-K2855B Front Flame Scanners CAB 32 TB2 Wiring Diagram.dwg
 1SGA-K2856A Rear Flame Scanner CAB 33 TB1 Wiring Diagram.dwg
 1SGA-K2856B Rear Flame Scanners CAB 33 TB2 Wiring Diagram.dwg
 1SGH-K2802K_R002 Burner Control System Cabinet 6 Wiring A & B.dwg
 1SGH-K2802L_R002 Burner Control System Cabinet 6 Wiring C & D.dwg
 1SGH-K2802M_R002 Burner Control System Cabinet 6 Wiring E & F.dwg
 1SGH-K2802N_R002 Burner Control System Cabinet 6 Wiring G & H.dwg

62.3401.05-11036 U1 Flame Scanner JBX Layout.dwg
 62.3401.05-11039 U1 Front Flame Scanner CAB Backpanel Top Layout.dwg
 62.3401.05-11040 U1 Front Flame Scanner CAB Backpanel Bottom Layout.dwg
 62.3401.05-11041 U1 Rear Flame Scanner CAB Backpanel Top Layout.dwg
 62.3401.05-11042 U1 Rear Flame Scanner CAB Backpanel Bottom Layout.dwg
 62.3401.05-11043 U1 Front Wall Burner and Cab Arrangement.dwg
 62.3401.05-11044 U1 Rear Wall Burner and Cab Arrangement.dwg

JOB PACKAGE #3

Capital Project IGS04-08 O₂ Measurement System Replacement

Project Description: IPSC is replacing the existing O₂ measurement system for IGS Unit 1. This Work includes demolition, removal, installation, documentation, and cleanup as specified per the following:

Scope of Work:

1. Remove existing COSA and Yokogawa probes and plumbing.
 - a. Total of eight (8) probes and connected sample gas tubing.
 - b. Remove of necessary conduit pieces.
2. Remove existing O₂ analyzer equipment from cabinet 1SGA-CAB-0031 and install brackets and mounting plates in cabinet 1SGA-CAB-0018.
3. Install O₂ probes in protective stand-pipes. (Stand-pipe installation to be completed by others).
 - a. 6' (2m)
 - b. 12' (3.6m)
 - c. 18' (5.4m)
4. Install new wireways and conduit.
 - a. Wireway across north boiler buckstay on the north side of the 11th level. Labeled on overview drawing 1IGS04-08-#0001 as 1WLC0738 east side and 1WLC0739 west side.
 - b. Install flexible conduit labeled 1RLG0826 and 1RLG0827 from wireway 1WLC0738 and 1WLC0739 to cable tray 1TLC0069 per drawing 1EEC-E30xx and overview drawing 1IGS04-08-#0001.
 - c. Install conduit runs 1RLG0808 to 1RLG0825 from wireways 1WLC0738 and 1WLC0739 to individual probes per drawings 1EEC-E3106, 1EEC-E3107, and overview drawing 1IGS04-08-#0001.
5. Install terminal blocks in common cabinets and cabinet lighting and receptacles per drawing 1IGS04-08-#0002 and 1IGS04-08-#0003.
6. Install transmitter/averaging units and calibration units per drawings 1IGS04-08-#0002 and 1IGS04-08-#0003.
7. Install instrument cabling from the DCS marshalling cabinets Unit 1, 3rd level, 1INA-CAB-0001 and IINA-CAB-0002 to the O₂ common cabinets terminal blocks Unit 1, 11th level, 1SGA-CAB-0031 and 1SGA-CAB-0018, including installation of conduit or tray necessary for connections to cabinets.
 - a. Cable Routes 1 & 2: Control Equipment Room 3rd level to 11th level northeast corner.
 - b. Cable Routes 3 & 4: Control Equipment Room 3rd level to 11th level northwest corner.

JOB PACKAGE #3

8. Install instrument cabling from the DCS marshalling cabinet 1INA-CAB-0002 to CCS marshalling cabinet 1COA-CAB-A2.
 - a. Cable Route 7: Cabinet 1COA-CAB-0002, A2, through wiring gallery up to 1INA-CAB-0002.
 - b. Reference drawings 1COA-K2806A and 1INA-K2831.
 - c. Reference drawing 1EEC-E3514 for cabinet locations.
9. Install power cable from power panels for system from Xxth and 10th level power panels to common cabinets terminal blocks and common cabinet internal lighting and receptacles per drawings 1SGA-K2854, 1SGA-K2855A, 1SGA-K2855B, and 1EEC-Exxxx.
 - a. 1PPL-xxxx to 1SGA-CAB-0031 (Power cable installed, re-termination required).
 - b. Cable Routes 6: 1PPL-xxxx to 1SGA-CAB-0018 (New power cables to be installed).
10. Install power and instrument cable from common cabinets terminal blocks to averaging units per drawings 1SGA-K2854, 1SGA-K2855A, 1SGA-K2855B, and INTERNAL #1, #2, and #3.
11. Install power and instrument cable from common cabinets terminal blocks to calibration units per drawings 1SGA-K2854, 1SGA-K2855A, 1SGA-K2855B, and INTERNAL #1, #2, and #3.
12. Install power and instrument cable from common cabinet terminal blocks to O₂ probe heads including installation of necessary conduit runs not already installed per drawings 1SGA-K2854, 1SGA-K2855A, and 1SGA-K2855B.
 - a. Cable Routes 8 through 13: Probes 1SGA-ANZ-30 through 35 to 1SGA-CAB-0031.
 - b. Cable Routes 14 through 25: Probes 1SGA-ANZ-36 through 47 to 1SGA-CAB-0018.
13. Install calibration gas tubing, valves, and regulators. Refer to tubing overview drawings 1IGS04-08#0004 and/or 1SGA-M2xxx (to be provided).
 - a. Includes installation of a calibration and purge gas line to each probe from its respective calibration unit. Probe row 1 lines will come from the calibration unit 1SGA-ANZ-49 in cabinet 1SGA-CAB-31. Probe rows 2 and 3 lines will come from calibration unit 1SGA-ANZ-51 and 1SGA-ANZ-53, respectively, which are located in cabinet 1SGA-CAB-0018.
 - b. Install calibration gas cylinder rack at 1SGA-CAB-0018.
 - c. Zero gas tubing and valves.
 - d. Install calibration gas tubing and valves.
14. Install connection from instrument air to calibration system, including filters. Refer to drawings 1IGS04-08-#0004 and/or 1SGA-M2xxx.
 - a. Install tee with isolation valve in control air header.
 - b. Install tubing, filters, and local shut-off valves.

JOB PACKAGE #3

15. Demolition and Removal: Contractor must remove existing O₂ probes, associated tubing, and calibration and averaging equipment, includes wiring designated to be abandoned.
16. Documentation: Contractor shall be responsible to provide undated "as-built" copies of the construction drawings for all installed equipment and wiring.

Materials Supplied by Owner: Materials to be supplied by Owner will include the following:

1. O₂ probes.
2. Probe standoff/mounting pipes.
3. Mounting pipe bracing.
4. Calibration/averaging cabinets.
5. Instrument and power wire, excluding cabinet and wireway ground wire.
6. Filter units for plant control air supply to calibration units.
7. Calibration and averaging/transmitter units.
8. Limited quantity of tubing components supplied with O₂ system calibration units; however, most tubing components shall be provided by Contractor.

All other required material shall be supplied by Contractor.

Reference Drawings:

1IGS04-08-#0001	1IGS04-08-#0002
1IGS04-08-#0003	1IGS04-08-#0004
INTERNAL #0001	INTERNAL #0002
INTERNAL #0003	1SGA-K2854 (DEMOLITION)
1SGA-K2854	1SGA-K2855A
1SGA-K2855B	1INA-K2818
1INA-K2820	1INA-K2831
1COA-K2806A	1COA-K2806B
1EEC-E3514	1EEC-E3513
1EEC-E3025	1EEC-E3035
1EEC-E3037	1EEC-E3047
1EEC-E3057	1EEC-E3067
1EEC-E3077	1EEC-E3086
1EEC-E3087	1EEC-E3096
1EEC-E3106	1EEC-E3107
1EEC-E3116	1EEC-E3117

EQUIPMENT LIST					
Item	Description	Project ID	Elev./Column&Row /Routine	Model, Size, or Diameter	ucm-row-col-pt
1.	NE O2 Cabinet.	ISGA-CAB-0031		Existing	
2.	NW O2 Cabinet	ISGA-CAB-0018		Existing	
3.	O2 Averaging Unit - Row 1	ISGA-CAB-0048		Yokogawa AV550	
4.	O2 Calibration Unit - Row 1	ISGA-CAB-0049		Yokogawa AC8	
5.	O2 Averaging Unit - Row 2	ISGA-CAB-0050		Yokogawa AV550	
6.	O2 Calibration Unit - Row 2	ISGA-CAB-0051		Yokogawa AC8	
7.	O2 Averaging Unit - Row 3	ISGA-CAB-0052		Yokogawa AV550	
8.	O2 Calibration Unit - Row 3	ISGA-CAB-0053		Yokogawa AC8	
9.	O2 Probe 1-1	ISGA-ANZ-0030		6' (2m)	
10.	O2 Probe 1-2	ISGA-ANZ-0031		6' (2m)	
11.	O2 Probe 1-3	ISGA-ANZ-0032		6' (2m)	
12.	O2 Probe 1-4	ISGA-ANZ-0033		6' (2m)	
13.	O2 Probe 1-5	ISGA-ANZ-0034		6' (2m)	
14.	O2 Probe 1-6	ISGA-ANZ-0035		6' (2m)	
15.	O2 Probe 2-1	ISGA-ANZ-0036		13' (4.2m)	
16.	O2 Probe 2-2	ISGA-ANZ-0037		13' (4.2m)	
17.	O2 Probe 2-3	ISGA-ANZ-0038		13' (4.2m)	
18.	O2 Probe 2-4	ISGA-ANZ-0039		13' (4.2m)	
19.	O2 Probe 2-5	ISGA-ANZ-0040		13' (4.2m)	
20.	O2 Probe 2-6	ISGA-ANZ-0041		13' (4.2m)	
21.	O2 Probe 3-1	ISGA-ANZ-0042		18' (5.4m)	
22.	O2 Probe 3-2	ISGA-ANZ-0043		18' (5.4m)	

23.	O2 Probe 3-3	ISGA-ANZ-0044		18' (5.4m)	
24.	O2 Probe 3-4	ISGA-ANZ-0045		18' (5.4m)	
25.	O2 Probe 3-5	ISGA-ANZ-0046		18' (5.4m)	
26.	O2 Probe 3-6	ISGA-ANZ-0047		18' (5.4m)	

Cable Routes						
Route #	CR1	CR2	CR3	CR4	CR5	CR6
General Desc.	1INA-CAB-1 to 1SGA-CAB-0031	1INA-CAB-2 to 1SGA-CAB-0031	1INA-CAB-1 to 1SGB-CAB-0018	1INA-CAB-2 to 1SGB-CAB-0018	1INA-CAB-0002 to 1COA-CAB-0002	1APA-PPL-xxx to 1SGA-CAB-0018
Detailed Route Desc.	1INA-CAB-0001 (4718'), 1WPC0007 (4708'), 1WPC0010 (4708'), 1WPC0014 (4708'), 1WPC0015 (4708'), 1TLC0148 (4708'), 1TLC0147 (4697'-4718'), 1TLC0139 (4718'), 1TLC0140 (4718'), 1TLB0108 (4718' - 4743'), 1TLB0109 (4743' - 4758'), 1TLB0110 (4758'-4788'), 1TLC0057 (4788'), 1TLC0056 (4788'), 1TLC0058 (4788'-4803'), 1TLC0060 (4803'-4816'), 1TLC0061 (4816'), 1WLCxxxx (4816'), 1RLCxxxx (4816'), 1SGA-CAB-0031	1INA-CAB-0002 (4718'), 1WPC0007 (4708'), 1WPC0010 (4708'), 1WPC0014 (4708'), 1WPC0015 (4708'), 1TLC0148 (4708'), 1TLC0147 (4697'-4718'), 1TLC0139 (4718'), 1TLC0140 (4718'), 1TLB0108 (4718' - 4743'), 1TLB0109 (4743' - 4758'), 1TLB0110 (4758'-4788'), 1TLC0057 (4788'), 1TLC0056 (4788'), 1TLC0058 (4788'-4803'), 1TLC0060 (4803'-4816'), 1TLC0061 (4816'), 1WLCxxxx (4816'), 1RLCxxxx (4816'), 1SGA-CAB-0031	1INA-CAB-0001 (4718'), 1WPC0007 (4708'), 1WPC0010 (4708'), 1WPC0014 (4708'), 1WPC0015 (4708'), 1TLC0148 (4708'), 1TLC0147 (4697'-4718'), 1TLC0139 (4718'), 1TLC0140 (4718'), 1TLB0108 (4718' - 4743'), 1TLB0109 (4743' - 4758'), 1TLB0110 (4758'-4788'), 1TLC0066 (4788'-4803'), 1TLC0068 (4803'-4816'), 1TLC0069 (4816'), 1RLC9324 (4816'), 1SGA-CAB-0018	1INA-CAB-0002 (4718'), 1WPC0007 (4708'), 1WPC0010 (4708'), 1WPC0014 (4708'), 1WPC0015 (4708'), 1TLC0148 (4708'), 1TLC0147 (4697'-4718'), 1TLC0139 (4718'), 1TLC0140 (4718'), 1TLB0108 (4718' - 4743'), 1TLB0109 (4743' - 4758'), 1TLB0110 (4758'-4788'), 1TLC0066 (4788'-4803'), 1TLC0068 (4803'-4816'), 1TLC0069 (4816'), 1RLC9324 (4816'), 1SGA-CAB-0018	1INA-0002 (4718'), 1WPC0007 (4708'), 1WPC0008 (4708'), 1COA-CAB0002 (4718')	
Route #	CR7	CR8	CR9	CR10	CR11	CR12
General Desc.	1SGA-CAB-0018 to 1SGA-CAB-0031	1SGA-CAB-0031 to 1SGA-ANZ-30	1SGA-CAB-0031 to 1SGA-ANZ-31	1SGA-CAB-0031 to 1SGA-ANZ-32	1SGA-CAB-0031 to 1SGA-ANZ-33	1SGA-CAB-0031 to 1SGA- ANZ-34
Detailed Route Desc.	1SGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') 1TLC0068 (4816'-4788') 1TLB0057 (4788') 1TLB0056 (4788') 1TLC0058 (4788-4803') 1TLC0060 (4803'-4816') 1TLC0061 (4816') 1RLG0828??? (4816')	1SGA-CAB-0031 (4816') 1RLG0828??? (4816') 1TLC0061 (4816') 1RLG0826 (4816') 1WLC0738 (4816') 1RLG0808 (4816') 1SGA-ANZ-30	1SGA-CAB-0031 (4816') 1RLG0828??? (4816') 1TLC0061 (4816') 1RLG0826 (4816') 1WLC0738 (4816') 1RLG0811 (4816') 1SGA-ANZ-31	1SGA-CAB-0031 (4816') 1RLG0828??? (4816') 1TLC0061 (4816') 1RLG0826 (4816') 1WLC0738 (4816') 1RLG0814 (4816') 1SGA-ANZ-32	1SGA-CAB-0031 (4816') 1RLG0828??? (4816') 1TLC0061 (4816') 1RLG0826 (4816') 1WLC0738 (4816') 1WLC0739 (4816') 1RLG0817 (4816') 1SGA-ANZ-33	1SGA-CAB-0031 (4816') 1RLG0828??? (4816') 1TLC0061 (4816') 1RLG0826 (4816') 1WLC0738 (4816') 1WLC0739 (4816') 1RLG0820 (4816') 1SGA-ANZ-34

Route #	CR13	CR14	CR15	CR16	CR17	CR18
General Desc.	ISGA-CAB-0031 to ISGA-ANZ-35	ISGA-CAB-0018 to ISGA-ANZ-36	ISGA-CAB-0018 to ISGA-ANZ-37	ISGA-CAB-0018 to ISGA-ANZ-38	ISGA-CAB-0018 to ISGA-ANZ-39	ISGA-CAB-0018 to ISGA-ANZ-40
Detailed Route Desc.	ISGA-CAB-0031 (4816') IRLG0828777 (4816') 1TLC0061 (4816') IRLG0826 (4816') 1WLC0738 (4816') 1WLC0739 (4816') IRLG0823 (4816') ISGA-ANZ-35	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0809 (4816') ISGA-ANZ-36	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0812 (4816') ISGA-ANZ-37	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0815 (4816') ISGA-ANZ-38	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0818 (4816') ISGA-ANZ-39	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0821 (4816') ISGA-ANZ-40
Route #	CR19	CR20	CR21	CR22	CR23	CR24
General Desc.	ISGA-CAB-0018 to ISGA-ANZ-41	ISGA-CAB-0018 to ISGA-ANZ-42	ISGA-CAB-0018 to ISGA-ANZ-43	ISGA-CAB-0018 to ISGA-ANZ-44	ISGA-CAB-0018 to ISGA-ANZ-45	ISGA-CAB-0018 to ISGA-ANZ-46
Detailed Route Desc.	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') IRLG0823 (4816') ISGA-ANZ-41	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0810 (4816') ISGA-ANZ-42	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0813 (4816') ISGA-ANZ-43	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') 1WLC0738 (4816') IRLG0816 (4816') ISGA-ANZ-44	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') IRLG0819 (4816') ISGA-ANZ-45	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0739 (4816') IRLG0822 (4816') ISGA-ANZ-46
Route #	CR25					
General Desc.	ISGA-CAB-0018 to ISGA-ANZ-47					
Detailed Route Desc.	ISGA-CAB-0018 (4816') 1WLC0740 (4816') 1TLC0069 (4816') IRLG0827 (4816') 1WLC0738 (4816') 1WLC0739 (4816') IRLG0825 (4816') ISGA-ANZ-47					

Electrical & Instrument Cable Listing									
Item No.	Type lw=Inst. Wire pw=Pwr. Wire	Description	New Conduit M=multiple circuit S=single circuit	Project Circuit ID	Elev./Column&Row/Routing	Cable Dia.	Route #	ESTIMATED Cable Length	
1.	lw	3 rd lvl relay room to 10 th lvl, N East of boiler 1INA-CAB-0001 to ISGA-CAB-0031 2core/16 awg-FR-shielded for DO&DI	M	ISGAK285409	1INA-CAB0001 (4716') to ISGA-CAB-0031 (4816')	0.38	CR1	585	
2.	lw	3 rd lvl relay room to 10 th lvl, N East of boiler 1INA-CAB-0001 to ISGA-CAB-0031 8core/16 awg-FR-shielded for DO&DI	M	ISGAK285413	1INA-CAB0001 (4716') to ISGA-CAB-0031 (4816')	0.56	CR1	585	
3.	lw	3 rd lvl relay room to 10 th lvl, N E of boiler 1INA-CAB-0001 to ISGA-CAB-0031 8core/16 awg-FR-shielded for DO&DI	M	ISGAK285414	1INA-CAB0001 (4716') to ISGA-CAB-0031 (4816')	0.56	CR1	585	
4.	lw	3 rd lvl relay room to 10 th lvl, N East of boiler 1INA-CAB-0001 to ISGA-CAB-0018 2core/16 awg-FR-shielded for DO&DI	M	ISGAK2855A09	1INA-CAB0001 (4716') to ISGA-CAB-0018 (4816')	0.695	CR1	450	
5.	lw	3 rd lvl relay room to 10 th lvl, N East of boiler 1INA-CAB-0001 to ISGA-CAB-0018 2core/16 awg-FR-shielded for DO&DI	M	ISGAK2855B09	1INA-CAB0001 (4716') to ISGA-CAB-0018 (4816')	0.695	CR1	450	
6.	lw	3 rd lvl relay room to 10 th lvl, N W of boiler 1INA-CAB-0002 to ISGA-CAB-0018 4pr/16 awg-FR-shielded/twisted	M	ISGAK2855A10	1INA-CAB-0002 to ISGA-CAB-0018	0.695	CR4	450	
7.	lw	3 rd lvl relay room to 10 th lvl, N West of boiler 1INA-CAB-0002 to ISGA-CAB-0018 4pr/16 awg-FR-shielded/twisted	M	ISGAK2855A11	1INA-CAB-0002 to ISGA-CAB-0018	0.695	CR4	450	
8.	lw	3 rd lvl relay room to 10 th lvl, N W of boiler 1INA-CAB-0002 to ISGA-CAB-0018 4pr/16 awg-FR-shielded/twisted	M	ISGAK2855B10	1INA-CAB-0002 to ISGA-CAB-0018	0.695	CR4	450	
9.	lw	3 rd lvl relay room to 10 th lvl, N W of boiler 1INA-CAB-0002 to ISGA-CAB-0018 4pr/16 awg-FR-shielded/twisted	M	ISGAK2855B11	1INA-CAB-0002 to ISGA-CAB-0018	0.695	CR4	450	

10.	Iw	3 rd lvl relay room to 10 th lvl, N W of boiler 11NA-CAB-0002 to 1SGA-CAB-0018 8core/16 awg-FR-shielded for DO&DI	M		1SGAK2855A12	11NA-CAB-0001 to 1SGA- CAB-0018	0.56	CR2	450
11.	Iw	3 rd lvl relay room to 10 th lvl, NW of boiler 11NA-CAB-0002 to 1SGA-CAB-0018 8core/16 awg-FR-shielded for DO&DI	M		1SGAK2855A13	11NA-CAB-0001 to 1SGA- CAB-0018	0.56	CR2	450
12.	Iw	3 rd lvl relay room to 10 th lvl, NW of boiler DAS02 to 1SGA-CAB-0018 8core/16 awg-FR-shielded for DO&DI	M		1SGAK2855B12	11NA-CAB-0001 to 1SGA- CAB-0018	0.56	CR2	450
13.	Iw	3 rd lvl relay room to 10 th lvl, NW of boiler DAS02 to 1SGA-CAB-0018 8core/16 awg-FR-shielded for DO&DI	M		1SGAK2855B13	11NA-CAB-0001 to 1SGA- CAB-0018	0.56	CR2	450
14.	Iw	10 TH lvl NW of boiler to 10 th lvl, NE of boiler 1SGA-CAB-0018 to 1SGA-CAB-31 4core/16 awg-FR-shielded for DO&DI	M		1SGAK2855A14	1SGA-CAB-0018 to 1SGA- CAB-0031	0.44	CR1	450
		Total 4pr/16 AWG twisted shielded			1800	Total DO/DI 8 core/16 AWG shielded			3555
		Total DO/DI 4 core/16 AWG shielded			450	Total DO/DI 2 core/16 AWG shielded			1485
15.	Iw	10 th lvl - CAB-0031 to O2 probe 1-1 1SGA-CAB-31 to 1SGA-ANZ-30 3pr./16 awg-FR-shielded/twisted	M		1SGAK285403	1SGA- CAB-31 to 1SGA-ANZ-30- 85'	0.60	CR8	75
16.	Iw	10 th lvl - CAB-0031 to O2 probe 1-2 1SGA-CAB-31 to 1SGA-ANZ-31 3pr./16 awg-FR-shielded/twisted	M		1SGAK285404	1SGA- CAB-31 to 1SGA-ANZ-31- 85'	0.60	CR9	85
17.	Iw	10 th lvl - CAB-0031 to O2 probe 1-3 1SGA-CAB-31 to 1SGA-ANZ-32 3pr./16 awg-FR-shielded/twisted	M		1SGAK285405	1SGA- CAB-31 to 1SGA-ANZ-32- 85'	0.60	CR10	100
18.	Iw	10 th lvl - CAB-0031 to O2 probe 1-4 1SGA-CAB-31 to 1SGA-ANZ-33 3pr./16 awg-FR-shielded/twisted	M		1SGAK285406	1SGA- CAB-31 to 1SGA-ANZ-33- 85'	0.60	CR11	125
19.	Iw	10 th lvl - CAB-0031 to O2 probe 1-5 1SGA-CAB-31 to 1SGA-ANZ-34 3pr./16 awg-FR-shielded/twisted	M		1SGAK285407	1SGA- CAB-31 to 1SGA-ANZ-34- 85'	0.60	CR12	140
20.	Iw	10 th lvl - CAB-0031 to O2 probe 1-6 1SGA-CAB-31 to 1SGA-ANZ-35 3pr./16 awg-FR-shielded/twisted	M		1SGAK285408	1SGA- CAB-31 to 1SGA-ANZ-35- 85'	0.60	CR13	155

21.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-1 ISGA-CAB-18 to ISGA-ANZ-36 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A03	ISGA- CAB-18 to ISGA-ANZ-36- 85'	0.60	CR14	65
22.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-2 ISGA-CAB-18 to ISGA-ANZ-37 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A04	ISGA- CAB-18 to ISGA-ANZ-37- 85'	0.60	CR15	80
23.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-3 ISGA-CAB-18 to ISGA-ANZ-38 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A05	ISGA- CAB-18 to ISGA-ANZ-38- 85'	0.60	CR16	95
24.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-4 ISGA-CAB-18 to ISGA-ANZ-39 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A06	ISGA- CAB-18 to ISGA-ANZ-39- 85'	0.60	CR17	125
25.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-5 ISGA-CAB-18 to ISGA-ANZ-40 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A07	ISGA- CAB-18 to ISGA-ANZ-40- 85'	0.60	CR18	140
26.	Iw	10 th Ivl - CAB-0018 to O2 probe 2-6 ISGA-CAB-18 to ISGA-ANZ-41 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855A08	ISGA- CAB-18 to ISGA-ANZ-41- 85'	0.60	CR19	155
27.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-1 ISGA-CAB-18 to ISGA-ANZ-42 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B03	ISGA- CAB-18 to ISGA-ANZ-42- 85'	0.60	CR20	65
28.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-2 ISGA-CAB-18 to ISGA-ANZ-43 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B04	ISGA- CAB-18 to ISGA-ANZ-43- 85'	0.60	CR21	80
29.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-3 ISGA-CAB-18 to ISGA-ANZ-44 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B05	ISGA- CAB-18 to ISGA-ANZ-44- 85'	0.60	CR22	95
30.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-4 ISGA-CAB-18 to ISGA-ANZ-45 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B06	ISGA- CAB-18 to ISGA-ANZ-45- 85'	0.60	CR23	125
31.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-5 ISGA-CAB-18 to ISGA-ANZ-46 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B07	ISGA- CAB-18 to ISGA-ANZ-46- 85'	0.60	CR24	140
32.	Iw	10 th Ivl - CAB-0018 to O2 probe 3-6 ISGA-CAB-18 to ISGA-ANZ-47 3pr./16 awg-FR-shielded/twisted	M		ISGAK2855B08	ISGA- CAB-18 to ISGA-ANZ-47- 85'	0.60	CR25	155
		Total							2000

33.	lw	3 RD lvl INA CAB2 to COA-CAB-A2 1INA-CAB-2 to 1COA-CAB-0002 1pr/16 awg-FR-shielded/twisted	S		1INAK283101	1INA- CAB-2 to 1COA-CAB-0002- 80'	.37	CR9	140
34.	lw	3 RD lvl INA CAB2 to COA-CAB-A2 1INA-CAB-2 to 1COA-CAB-0002 1pr/16 awg-FR-shielded/twisted	S		1INAK283102	1INA- CAB-2 to 1COA-CAB-0002- 80'	0.37	CR9	140
		Total							280

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35.	Iw	10 th lvl - CAB-0031 to O2 probe 1-1 ISGA-CAB-31 to ISGA-ANZ-30 1pr./16 awg-FR-shielded/twisted	S		ISGAK285415	ISGA- CAB-31 to ISGA-ANZ-30	0.40	CR8	75
36.	Iw	10 th lvl - CAB-0031 to O2 probe 1-2 ISGA-CAB-31 to ISGA-ANZ-31 1pr./16 awg-FR-shielded/twisted	S		ISGAK285416	ISGA- CAB-31 to ISGA-ANZ-31	0.40	CR9	85
37.	Iw	10 th lvl - CAB-0031 to O2 probe 1-3 ISGA-CAB-31 to ISGA-ANZ-32 1pr./16 awg-FR-shielded/twisted	S		ISGAK285417	ISGA- CAB-31 to ISGA-ANZ-32	0.40	CR10	100
38.	Iw	10 th lvl - CAB-0031 to O2 probe 1-4 ISGA-CAB-31 to ISGA-ANZ-33 1pr./16 awg-FR-shielded/twisted	S		ISGAK285418	ISGA- CAB-31 to ISGA-ANZ-33	0.40	CR11	125
39.	Iw	10 th lvl - CAB-0031 to O2 probe 1-5 ISGA-CAB-31 to ISGA-ANZ-34 1pr./16 awg-FR-shielded/twisted	S		ISGAK285419	ISGA- CAB-31 to ISGA-ANZ-34	0.40	CR12	140
40.	Iw	10 th lvl - CAB-0031 to O2 probe 1-6 ISGA-CAB-31 to ISGA-ANZ-35 1pr./16 awg-FR-shielded/twisted	S		ISGAK285420	ISGA- CAB-31 to ISGA-ANZ-35	0.40	CR13	155
41.	Iw	10 th lvl - CAB-0018 to O2 probe 2-1 ISGA-CAB-18 to ISGA-ANZ-36 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A15	ISGA- CAB-18 to ISGA-ANZ-36	0.40	CR14	65
42.	Iw	10 th lvl - CAB-0018 to O2 probe 2-2 ISGA-CAB-18 to ISGA-ANZ-37 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A16	ISGA- CAB-18 to ISGA-ANZ-37	0.40	CR15	80
43.	Iw	10 th lvl - CAB-0018 to O2 probe 2-3 ISGA-CAB-18 to ISGA-ANZ-38 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A17	ISGA- CAB-18 to ISGA-ANZ-38	0.40	CR16	95
44.	Iw	10 th lvl - CAB-0018 to O2 probe 2-4 ISGA-CAB-18 to ISGA-ANZ-39 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A18	ISGA- CAB-18 to ISGA-ANZ-39	0.40	CR17	125
45.	Iw	10 th lvl - CAB-0018 to O2 probe 2-5 ISGA-CAB-18 to ISGA-ANZ-40 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A19	ISGA- CAB-18 to ISGA-ANZ-40	0.40	CR18	140
46.	Iw	10 th lvl - CAB-0018 to O2 probe 2-6 ISGA-CAB-18 to ISGA-ANZ-41 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855A20	ISGA- CAB-18 to ISGA-ANZ-41	0.40	CR19	155

	47.	Iw	10 th lvl - CAB-0018 to O2 probe 3-1 ISGA-CAB-18 to ISGA-ANZ-42 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B15	ISGA- CAB-18 to ISGA-ANZ-42- 85'	0.40	CR20	65
	48.	Iw	10 th lvl - CAB-0018 to O2 probe 3-2 ISGA-CAB-18 to ISGA-ANZ-43 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B16	ISGA- CAB-18 to ISGA-ANZ-43- 85'	0.40	CR21	80
	49.	Iw	10 th lvl - CAB-0018 to O2 probe 3-3 ISGA-CAB-18 to ISGA-ANZ-44 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B17	ISGA- CAB-18 to ISGA-ANZ-44- 85'	0.40	CR22	95
	50.	Iw	10 th lvl - CAB-0018 to O2 probe 3-4 ISGA-CAB-18 to ISGA-ANZ-45 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B18	ISGA- CAB-18 to ISGA-ANZ-45- 85'	0.40	CR23	125
	51.	Iw	10 th lvl - CAB-0018 to O2 probe 3-5 ISGA-CAB-18 to ISGA-ANZ-46 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B19	ISGA- CAB-18 to ISGA-ANZ-46- 85'	0.40	CR24	140
	52.	Iw	10 th lvl - CAB-0018 to O2 probe 3-6 ISGA-CAB-18 to ISGA-ANZ-47 1pr./16 awg-FR-shielded/twisted	S		ISGAK2855B20	ISGA- CAB-18 to ISGA-ANZ-47- 85'	0.40	CR25	155
Power Cables to O2 Analyzer Enclosures										
PPL to NW COMMON CAB	53.	Pw	10 th lvl XX to 10 th lvl NE AV-550 PPL-00X to ISGA-CAB-18, ANZ-50 12 awg-FR-3/C	S		ISGAK2855A01	PPL00x (47xx') to CAB-31 - 75' - Route CR5	0.5	CR5	110
	54.	Pw	10 th lvl XX to 10 th lvl NE AC-8 PPL-00X to ISGA-CAB-18, ANZ-51 12 awg-FR-3/C	S		ISGAK2855A02	PPL00x (47xx') to CAB-31 - 75' - Route CR5	0.5	CR5	110
	55.	Pw	10 th lvl XX to 10 th lvl NE AV-550 PPL-00X to ISGA-CAB-18, ANZ-52 12 awg-FR-3/C	S		ISGAK2855B01	PPL00x (47xx') to CAB-31 - 75' - Route CR5	0.5	CR5	110
	56.	Pw	10 th lvl XX to 10 th lvl NE AC-8 PPL-00X to ISGA-CAB-18, ANZ-53 12 awg-FR-3/C	S		ISGAK2855B02	PPL00x (47xx') to CAB-31 - 75' - Route CR5	0.5	CR5	110

NEW CONDUIT & Included Cables						
Conduit or Wireway #	Routes	Included Cables	Dia. Cable	Area/Cable	Total Cable Area	Estimated Minimum Recommended Conduit Size
1WLC0738 & 1WLC0739	CR8	1SGAK285403 1SGAK285415	0.40 0.60	.5 1.13	29.34	8" X 8" Wireway
	CR9	1SGAK285404 1SGAK285416	0.40 0.60	.5 1.13		
	CR10	1SGAK285405 1SGAK285417	0.40 0.60	.5 1.13		
	CR11	1SGAK285406 1SGAK285418	0.40 0.60	.5 1.13		
	CR12	1SGAK285407 1SGAK285419	0.40 0.60	.5 1.13		
	CR13	1SGAK285408 1SGAK285420	0.40 0.60	.5 1.13		
	CR14	1SGAK2855A03 1SGAK2855A15	0.40 0.60	.5 1.13		
	CR15	1SGAK2855A04 1SGAK2855A16	0.40 0.60	.5 1.13		
	CR16	1SGAK2855A05 1SGAK2855A17	0.40 0.60	.5 1.13		
	CR17	1SGAK2855A06 1SGAK2855A18	0.40 0.60	.5 1.13		
	CR18	1SGAK2855A07 1SGAK2855A19	0.40 0.60	.5 1.13		
	CR19	1SGAK2855A08 1SGAK2855A20	0.40 0.60	.5 1.13		
	CR20	1SGAK2855B03 1SGAK2855B15	0.40 0.60	.5 1.13		
	CR21	1SGAK2855B04 1SGAK2855B16	0.40 0.60	.5 1.13		
	CR22	1SGAK2855B05 1SGAK2855B17	0.40 0.60	.5 1.13		

	CR23	ISGAK2855B06 ISGAK2855B18	0.40 0.60	.5 1.13		
	CR24	ISGAK2855B07 ISGAK2855B19	0.40 0.60	.5 1.13		
	CR25	ISGAK2855B08 ISGAK2855B20	0.40 0.60	.5 1.13		
IWLC0740	CR14	ISGAK2855A03 ISGAK2855A15	0.40 0.60	.5 1.13	28.4	8" X 8" Wireway
	CR15	ISGAK2855A04 ISGAK2855A16	0.40 0.60	.5 1.13		
	CR16	ISGAK2855A05 ISGAK2855A17	0.40 0.60	.5 1.13		
	CR17	ISGAK2855A06 ISGAK2855A18	0.40 0.60	.5 1.13		
	CR18	ISGAK2855A07 ISGAK2855A19	0.40 0.60	.5 1.13		
	CR19	ISGAK2855A08 ISGAK2855A20	0.40 0.60	.5 1.13		
	CR20	ISGAK2855B03 ISGAK2855B15	0.40 0.60	.5 1.13		
	CR21	ISGAK2855B04 ISGAK2855B16	0.40 0.60	.5 1.13		
	CR22	ISGAK2855B05 ISGAK2855B17	0.40 0.60	.5 1.13		
	CR23	ISGAK2855B06 ISGAK2855B18	0.40 0.60	.5 1.13		
	CR24	ISGAK2855B07 ISGAK2855B19	0.40 0.60	.5 1.13		
	CR25	ISGAK2855B08 ISGAK2855B20	0.40 0.60	.5 1.13		
	CR3	ISGAK2855A10 ISGAK2855A11 ISGAK2855B10 ISGAK2855B11	0.695 0.695 0.695 0.695	1.52 1.52 1.52 1.52		
	CR4	ISGAK2855A12 ISGAK2855A13 ISGAK2855B12 ISGAK2855B13	0.56 0.56 0.56 0.56	0.99 0.99 0.99 0.99		

	CR6	ISGAK2855A01 ISGAK2855A02 ISGAK2855B01 ISGAK2855B02	0.5 0.5 0.5 0.5	0.78 0.78 0.78 0.78		
	CR7	ISGAK2855A14	0.44	.61		
IRLG0808	CR8	ISGAK285403 ISGAK285415	0.40 0.60	.5 1.13	1.63	2.0
IRLG0809	CR14	ISGAK2855A03 ISGAK2855A15	0.40 0.60	.5 1.13	1.63	2.0
IRLG0810	CR20	ISGAK2855B03 ISGAK2855B15	0.40 0.60	.5 1.13	1.63	2.0
IRLG0811	CR9	ISGAK285404 ISGAK285416	0.40 0.60	.5 1.13	1.63	2.0
IRLG0812	CR15	ISGAK2855A04 ISGAK2855A16	0.40 0.60	.5 1.13	1.63	2.0
IRLG0813	CR21	ISGAK2855B04 ISGAK2855B16	0.40 0.60	.5 1.13	1.63	2.0
IRLG0814	CR10	ISGAK285405 ISGAK285417	0.40 0.60	.5 1.13	1.63	2.0
IRLG0815	CR16	ISGAK2855A05 ISGAK2855A17	0.40 0.60	.5 1.13	1.63	2.0
IRLG0816	CR22	ISGAK2855B05 ISGAK2855B17	0.40 0.60	.5 1.13	1.63	2.0
IRLG0817	CR16	ISGAK2855A05 ISGAK2855A17	0.40 0.60	.5 1.13	1.63	2.0
IRLG0818	CR17	ISGAK2855A06 ISGAK2855A18	0.40 0.60	.5 1.13	1.63	2.0
IRLG0819	CR23	ISGAK2855B06 ISGAK2855B18	0.40 0.60	.5 1.13	1.63	2.0
IRLG0820	CR12	ISGAK285407 ISGAK285419	0.40 0.60	.5 1.13	1.63	2.0
IRLG0821	CR18	ISGAK2855A07 ISGAK2855A19	0.40 0.60	.5 1.13	1.63	2.0
IRLG0822	CR24	ISGAK2855B07 ISGAK2855B19	0.40 0.60	.5 1.13	1.63	2.0

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IRLG0823	CR13	ISGAK285408 ISGAK285420	0.40 0.60	.5 1.13	1.63	2.0
IRLG0824	CR19	ISGAK2855A08 ISGAK2855A20	0.40 0.60	.5 1.13	1.63	2.0
IRLG0825	CR25	ISGAK2855B08 ISGAK2855B20	0.40 0.60	.5 1.13	1.63	2.0
IRLG0826	CR8	ISGAK285403 ISGAK285415	0.40 0.60	.5 1.13	9.78	5.75" OR 2 @ 4"
	CR9	ISGAK285404 ISGAK285416	0.40 0.60	.5 1.13		
	CR10	ISGAK285405 ISGAK285417	0.40 0.60	.5 1.13		
	CR11	ISGAK285406 ISGAK285418	0.40 0.60	.5 1.13		
	CR12	ISGAK285407 ISGAK285419	0.40 0.60	.5 1.13		
	CR13	ISGAK285408 ISGAK285420	0.40 0.60	.5 1.13		

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IRLG0827	CR13	ISGAK285408 ISGAK285420	0.40 0.60	.5 1.13	19.56	8" OR 2@ 6" OR 4@4"
	CR14	ISGAK2855A03 ISGAK2855A15	0.40 0.60	.5 1.13		
	CR15	ISGAK2855A04 ISGAK2855A16	0.40 0.60	.5 1.13		
	CR16	ISGAK2855A05 ISGAK2855A17	0.40 0.60	.5 1.13		
	CR17	ISGAK2855A06 ISGAK2855A18	0.40 0.60	.5 1.13		
	CR18	ISGAK2855A07 ISGAK2855A19	0.40 0.60	.5 1.13		
	CR19	ISGAK2855A08 ISGAK2855A20	0.40 0.60	.5 1.13		
	CR20	ISGAK2855B03 ISGAK2855B15	0.40 0.60	.5 1.13		
	CR21	ISGAK2855B04 ISGAK2855B16	0.40 0.60	.5 1.13		
	CR22	ISGAK2855B05 ISGAK2855B17	0.40 0.60	.5 1.13		
	CR23	ISGAK2855B06 ISGAK2855B18	0.40 0.60	.5 1.13		
	CR24	ISGAK2855B07 ISGAK2855B19	0.40 0.60	.5 1.13		
	CR25	ISGAK2855B08 ISGAK2855B20	0.40 0.60	.5 1.13		

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JOB PACKAGE #4

Capital Project IGS04-09 Stack Hoist

Project Description: IPSC is installing an additional power circuit to the mid-level of the stack to provide power for test equipment and to power a new hoist. Power for the hoist and power center shall be supplied by a parallel feed off of the existing power supply to the chimney, located at ground level.

Documentation: Contractor shall be responsible to provide undated "as-built" copies of the construction drawings for all installed equipment and wiring.

Installation shall be in accordance with the following drawings:

CEntry drawings: DT-04257-E-100
 DT-04257-E-101
IPSC drawing: 9255.61.1001.05-11049

The Scope of Work includes rerouting the existing power feed from the chimney main disconnect switch to a power terminal box. Contractor shall then install parallel power feeds to the chimney main disconnect switch and to the hoist and power center from the power terminal box.

Contractor shall supply all labor, equipment, and materials required for installation, except as noted on the drawings.

JOB PACKAGE #5

Capital Project IGS04-23 Telephone Switch Replacement

Project Description: IPSC is replacing the existing telephone switch. An existing 100-pair telephone cable is being removed and replaced with two (2) new fiber optic cables. This Project is for removal of the existing 100-pair telephone cable and installation of two (2) new fiber optic cables. IPSC will provide the fiber optic cables for installation by Contractor. The fiber optic cables will be installed in existing conduits and duct banks.

One (1) fiber optic cable will be installed between the Administration Building telephone room and the Management Office Building (MOB). This cable is 5,000 feet in length. The other cable will be installed between the MOB and the second floor of the Generating Station Control Building. This cable is 3,700 feet in length. The fiber optic cable is approximately 0.45 inches in diameter.

The existing 100 pair telephone cable is routed between the Administration Building and the MOB. Both fiber optic cables are to be installed in the same 5 inch conduit (the conduit which presently contains the 100-pair telephone cable) from the MOB until the circuits separate at manhole 9MH-0018.

Reference Drawings:

9EEC-2300A
9EEC-E2319
9STH-E2325
9STH-E2326
9STH-E2327
9STH-E2328



INTERMOUNTAIN POWER SERVICE CORP.

Delta, Utah 84624-9546 (435) 864-4414 - Purchasing FAX (435) 864-6878

VENDOR: CACHE VALLEY ELECTRIC CO
2345 SOUTH JOHN HENRY DRIVE
SALT LAKE CITY, UT 84119

PURCHASE ORDER

22 FEB 2005
REVISED 14 FEB 2007

VENDOR MUST SHOW P.O. NUMBER ON ALL INVOICES, BILL OF LADING, CORRESPONDENCE, AND ON PACKING LISTS IN EACH CONTAINER, TO INSURE PROMPT PAYMENT. CHARGES FOR TRANSPORTATION MUST BE SUPPORTED BY COPY OF FREIGHT BILL.

PURCHASE ORDER NO.	VENDOR CODE	REQUISITION NO
05-45652	8450	

* * * S H I P T O * * *
INTERMOUNTAIN POWER SERVICE CORPORATION
850 W. BRUSH WELLMAN RD.
DELTA , UT 84624-9546

801-908-6666

CONFIRMING DO NOT DUPLICATE <input checked="" type="checkbox"/>	NON CONFIRMING	SHIP VIA VENDOR TRUCK	TERMS AS INVOICED	FOB POINT S/P P.P. & ADD	PAGE OF 1 1	NONE
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INTERMOUNTAIN POWER SERVICE CORPORATION'S STANDARD TERMS AND CONDITIONS ARE INCLUDED AS PART OF THIS AGREEMENT

QUANTITY ORDERED	U M	IPSC PART NO.	DESCRIPTION	ACCOUNT NUMBER	UNIT PRICE	EXTENSION
			THIS IS A PURCHASE ORDER ADJUSTMENT **PER E-MAIL FROM JON CHRISTENSEN 2/14/07, EXTEND CONTRACT TO 06/30/07** JRL/CLE 2/14/07			

1. Invoices and correspondence may be mailed to Intermountain Power Service Corporation, 850 West Brush Wellman Rd., Delta, Utah, 84624-9546.
2. Acknowledgement is required if shipment will not be made within FIVE days.
3. **Mark packages or items with IPSC part number and/or P.O. Line number. Show number on invoice and packing slip.**
4. Vendor must furnish applicable material safety data sheets.
5. Add to invoice all applicable federal taxes.

UTAH VENDORS ARE TO ADD TO THE INVOICE
ALL APPLICABLE STATE, AND COUNTY TAXES.

OUT OF STATE VENDORS, LICENSED TO
COLLECT UTAH TAXES. ARE TO ADD TAX OF 6%.

UTAH TAXES WILL BE ACCRUED BY IPSC FOR
OUT OF STATE VENDORS NOT LICENSED TO
COLLECT UTAH STATE TAX

JOHN LARSEN 435-864-4414

REVIEWED BY GEORGE CROSS

IP7012137

INTERMOUNTAIN POWER SERVICE CORPORATION

☒ REQUISITION FOR CAPITAL EQUIPMENT

☐ PURCHASE AUTHORIZATION FOR EXPENSE ITEMS

Purpose of Materials, Supplies or Services:

Electrical Construction for Various Projects

Date:
Req./PA No: 206409
P.O. No: 05-45652
Vendor: 8450 Cache Valley E.
Terms: 6/
FOB: 5
Ship Via: 1
Conf. To: Mike Samworth

5/3/06

Suggested Vendor: See List of Bidders

Account No. Various

Work Order No. Various

Project No. Various

Qty	Unit	Noun	Description Adjective	Catalog #	Seller or Manufacturer	Unit Cost	Extension
1	Ea		Service Contract, Electrical Construction Services for installation of various capital projects and work. The contract includes some fixed price capital projects and some T&M and possibly some future fixed price work to be negotiated at a later date. Please establish the contract for the full requisition amount and for two years. We expect this amount to get us through the 2006 outage season. See attached contract and work packages. This will be similar to the existing supplemental maintenance contract except for it will be electrical instead of mechanical work. It also includes some fixed price work and we are going to try and do most of it on a fixed price basis in the future also.			\$1,000,000.00	\$1,000,000.00
TOTAL ESTIMATED COST							\$1,000,000.00

Remarks: See Jerry Hintze or Jon Christensen with any questions.

DEC 6 2004

Delivered by PURCHASING [Date] 1/15/05 Originator Jerry Hintze
12-17-04 12/20/04
 Dept. 1st Supt. Date Station Manager Date Operating Agent Date 1-13-05

IP7012138



INTERMOUNTAIN POWER SERVICE CORP.

Delta, Utah 84624-9546 (435) 864-4414 - Purchasing FAX (435) 864-6678

VENDOR: CACHE VALLEY ELECTRIC CO
2345 SOUTH JOHN HENRY DRIVE
SALT LAKE CITY, UT 84119

PURCHASE ORDER

22 FEB 2005

VENDOR MUST SHOW P.O. NUMBER ON ALL INVOICES, BILL OF LADING, CORRESPONDENCE, AND ON PACKING LISTS IN EACH CONTAINER, TO INSURE PROMPT PAYMENT. CHARGES FOR TRANSPORTATION MUST BE SUPPORTED BY COPY OF FREIGHT BILL.

PURCHASE ORDER NO.	VENDOR CODE	REQUISITION NO
05-45652	8450	206409

*** SHIP TO ***
INTERMOUNTAIN POWER SERVICE CORPORATION
850 W. BRUSH WELLMAN RD.
DELTA, UT 84624-9546

801-908-6666

CONFIRMING DO NOT DUPLICATE <input checked="" type="checkbox"/>	NON CONFIRMING	SHIP VIA VENDOR TRUCK	TERMS AS INVOICED	FOB POINT S/P P.P. & ADD	PAGE OF 1 1	NONE
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INTERMOUNTAIN POWER SERVICE CORPORATION'S STANDARD TERMS AND CONDITIONS ARE INCLUDED AS PART OF THIS AGREEMENT

QUANTITY ORDERED	U M	IPSC PART NO.	DESCRIPTION	ACCOUNT NUMBER	UNIT PRICE	EXTENSION
1	EA		LINE 1 SERVICE CONTRACT FOR ELECTRICAL CONSTRUCTION WORK FOR VARIOUS PROJECTS PER SPECIFICATIONS 45652 & CONTRACT 05-45652 CONFIRMING TO MIKE DAMEWORTH - DO NOT DUPLICATE JRL/CLE **PURCHASE ORDER ENTERED FOR ACCOUNTING & TRACKING PURPOSES ONLY** ****ATTENTION IPSC WAREHOUSE**** THIS ORDER IS FOR A SERVICE AND NO MATERIAL WILL BE RECEIVED DATE REQUIRED 02/17/07	9EQI-503	1,000,000.00	1,000,000.00
TOTAL COST						1,000,000.00

- Invoices and correspondence may be mailed to Intermountain Power Service Corporation, 850 West Brush Wellman Rd., Delta, Utah, 84624-9546.
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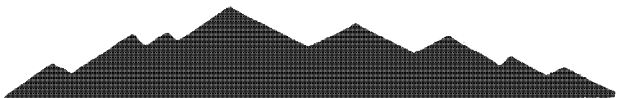
UTAH TAXES WILL BE ACCRUED BY IPSC FOR
OUT OF STATE VENDORS NOT LICENSED TO
COLLECT UTAH STATE TAX

JOHN LARSEN 435-864-4414

BUYER

REVIEWED BY GEORGE CROSS

IP7012139



INTERMOUNTAIN POWER SERVICE CORP.

Delta, Utah 84624-9546 (435) 864-4414 - Purchasing FAX (435) 864-6678

VENDOR: CACHE VALLEY ELECTRIC CO
2345 SOUTH JOHN HENRY DRIVE
SALT LAKE CITY, UT 84119

PURCHASE ORDER

22 FEB 2005
REVISED 06 AUG 2007

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PURCHASE ORDER NO.	VENDOR CODE	REQUISITION NO
05-45652	8450	

* * * S H I P T O * * *
INTERMOUNTAIN POWER SERVICE CORPORATION
850 W. BRUSH WELLMAN RD.
DELTA , UT 84624-9546

801-908-6666

CONFIRMING DO NOT DUPLICATE <input checked="" type="checkbox"/>	NON CONFIRMING	SHIP VIA VENDOR TRUCK	TERMS AS INVOICED	FOB POINT S/P P.P. & ADD	PAGE OF 1 1	NONE
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INTERMOUNTAIN POWER SERVICE CORPORATION'S STANDARD TERMS AND CONDITIONS ARE INCLUDED AS PART OF THIS AGREEMENT

QUANTITY ORDERED	U M	IPSC PART NO.	DESCRIPTION	ACCOUNT NUMBER	UNIT PRICE	EXTENSION
			THIS IS A PURCHASE ORDER ADJUSTMENT **PER E-MAIL FROM JON CHRISTENSEN 2/14/07, EXTEND CONTRACT TO 06/30/07** JRL/CLE 2/14/07 **PER JON CHRISTENSEN, EXTEND CONTRACT TO 09/30/07** JRL/CLE 8/6/07			

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JOHN LARSEN 435-864-4414

REVIEWED BY GEORGE CROSS

IP7012140